

TABLE OF CONTENT	Page
EDITORIAL	
Non-Violent Video Games: A Boon in Covid-19 Pandemic Era Khursheed Muzammil	1-3
ORIGINAL ARTICLE	
Study of Portal Vein Diameter and Grades of Oesophageal Varices in Patients of Cirrhosis of Liver with Portal Hypertension BP Priyadarshi, Imran Kamal Khan, Vinay Kumar, Ashok Kumar Verma, Tanu Midha, Madhuri and Mahendra Singh	4-7
Determinants of Anaemia among Pregnant Women Delivered in a Rural Tertiary Care Hospital in Sonipat: A Case Control Study Sunny Ohlan, S K Jha, JP Majra, Rajiv Mahendru	8-14
Comparison of Ziehl – Neelsen(ZN) Staining and Fluorescent(FI) Staining in Suspected Cases of Tuberculosis Rekha Bhandari, Dushyant Singh Gaur, Aarti Kotwal, Anuradha Kusum	15-20
Knowledge and Practice of Personal Hygiene among Adolescents of North India Faizur Rahman, Nayyar Azam	21-24
Determinants of Health Status of Current Neonates In Lucknow City of Uttar Pradesh Saurabh Kashyap , Jamaal Masood , Reema Kumari	25-29
Evaluation of Clinical Profile and Functional Outcome Following Surgical Intervention in Third Ventricular Colloid Cyst: An Institutional Experience Ranjit Kumar, Yashbir Dewan, Brijesh Kumar Tiwari, Sanjeev Kumar Pandey	30-35
A Retrospective Study on Road Traffic Accidents during the Last Decade (2009-2018) in Aseer Region, KSA Abdlrhman IA Asiri, Abdlrhman Albarqi , Waleed Alqрни , Khursheed Muzammil	36-42
Preoperative Skin Preparation with Povidone Iodine 10% and Its Effect on Resident Bacterial Flora Of Skin Rooman A. Rana	43-47



National Journal of Medical and Allied Sciences

[ISSN Online: 2319 – 6335, Print: 2393 – 9192] Editorial | Open Access |

Website:-www.njmsonline.org

NON-VIOLENT VIDEO GAMES: A BOON IN COVID-19 PANDEMIC ERA

Khursheed Muzammil

Associate Professor, Department of Public Health, College of Applied Medical Sciences, Khamis Mushait Campus, King Khalid University, Abha, Kingdom of Saudi Arabia Correspondence: ktahir@kku.edu.sa
ORCID ID: <https://orcid.org/0000-0003-1676-8092>

Video games as electronic & interactive games known for their vibrant colours, sound effects, and sophisticated graphics are the most favourite medium for entertainment among all age groups especially school going children. Generally, in many studies, playing video games have been found to be associated with poor academic performance among school going children and adolescents as well as related to developing dependence in all age groups. Video games especially the violent ones have proved to be exerting psychologically negative impact on the youngsters in pre-COVID times i.e., when there was no restriction of physical distancing or isolation or self-quarantine issues.

William Higinbotham was the first to design and implement a video game and Steve Russell is regarded as the first individual to create a game that inspires the multibillion-dollar video games industry.¹ They never thought that video games will be gaining too much popularity among all ages especially among school going children.² These video games can be grouped into puzzle, action, racing, card, simulations, bold and all these types of video games are further broadly categorized into three main types viz. Educational Video Games, Entertainment Video Games & Violent Video Games.³ The advent of computerized technology has transformed the entertainment industry.⁴

Now-a-days, different types of video games are being top-rated however violent video games and the characters used in it are creating a very negative image in the minds of school children.⁵ These psychological processes are described by the General Aggression Model (GAM) and the domain-specific theories which GAM incorporates. These “smaller” theories include script theory, attribution and decision-making, cognitive neoassociation theory, learning theories, and desensitization. Several other negative outcomes of video gaming have also been described which include risk taking, attention problems, impulsivity, reduced helping, stereotyping, and video game addiction.⁶

The current COVID-19 pandemic resulted in the development of some form of panic all over and insists the common man to be deliberately following social and physical distancing and self-quarantine. All these states are actually the most widely acceptable methods of prevention and control of COVID-19 globally.

In pre COVID-19 times, playing video games was not considered good from the children’s psychosocial development point of view however there are some recognised cognitive benefits viz, it improves coordination, improves problem solving skills, enhances memory, improves attention and concentration, great source of learning, improves the brain’s speed, enhancing multi-tasking and social skills also.

The COVID-19 restrictions, predominantly the complete or partial lockdowns are exerting anxiety and depression among majority of the people who have nothing to do from social perspective leading to psychosocial disorders mainly stress, anxiety and depression of varied levels. At this point of time, if we follow the WHO guideline for not adhering to use of video game screens excessively; 7 playing video games can be helpful in preventing social deprivation and psychosocial disorders especially anxiety, depression and prolonged stress due to monotonous life pattern that too without having any clue about regaining of normalcy because of COVID – 19 pandemic.

The benchmark for negative effects from playing video games centres on the 3-hour mark.⁸ So, educational video games can be incorporated for at least one hour per day as part of some assignment in the online course schedule to engage & improve the academic performance of the students, 9-10 to avoid developing any mental disorders as part of ill effects of COVID lockdown. A study also recommended that the teacher should be involved in the game - based learning to improve its effectiveness in the students learning, 11 and there by prevent the development of mental disorders of various kind as part of ill effect of COVID – 19 lockdowns.

Less than three hours of video gaming also helps to prevent sleep disturbances as playing for longer periods may increase the physiological arousal and cognitive alertness make it harder for adolescents to fall asleep after playing video games specially at night. Video game addiction especially with violent games leads to anxiety among other mental health issues. 8 So, parents should take the responsibility not to buy violent video games through the direct or online mode for their children as this may trigger their current psychosocial problem further if any. Video games are thought to distract children from the seriousness of academics and are considered an unproductive activity. 12 Well-designed video games are excellent teachers that are highly

motivating, engaging, and responsive to the player's skills, but the lessons drawn from video games can lead to both positive and negative outcomes. ¹³⁻¹⁴ Even if children have access to video games then the different parents among themselves should exchange their views about the playing habits of their kids & help each other in selecting the type of video games and designing a suitable schedule for playing video games which may not contribute to affect their academic performance, psychosocial environment, behavioural change and mental health as a whole rather it should help in preventing the mental disorders due to ill-effect of prolonged lockdowns.

No efforts have been noticed so far to address the mental health issues of the people especially children which may worsen the situation further during the COVID pandemic and subsequent lockdown. However, WHO has warned not to use the screens excessively (> 3 hours) and thereby video games also during COVID -19 pandemic era. ⁷⁻⁸

Hence, it's the high time to intervene and save the future of our children by means of allowing them to play video games except violent ones so that they can be engaged appropriately and the chance of development of psychosocial disorders can be prevented or minimised provided they play video games less than 3 hours, which in a study has been found to be the cut-off point to avoid the negative effects of playing video. ⁸ It is therefore recommended that people especially children must be given opportunity to play non-violent video games to pass their time as because they are unable to go for outing and playing in the fields in groups. These video games in fact if played for < 3hours, may help significantly the common man in removing their panic and prevent them from developing and or minimizing their anxiety, depression and other psychosocial ill-effects of lockdown, isolation and self-quarantine. Now, the same set of video games which were once considered as crotchety and crusty for many parents and teachers has

emerged as a great boon specially for the susceptible groups including children more prone to stress, anxiety, depression & related mental disorders of varied extent to come out from the unwanted psychosocial ill-effects of extended and prolonged COVID lockdown all over.

Acknowledgement: Author is highly thankful to King Khalid University, Abha, KSA, for providing all the technical support and help in the write up of this work.

REFERENCES:

1. Steve Rabin (Ed). Introduction to Game Development, 2nd Edition; 2010. Course Technology, a part of Cengage Learning 20 Channel Center Street Boston, MA 02210 USA. ISBN-13: 978-1-58450-679-9 ISBN-10: 1-58450-679-2: p.4 2.
2. Mitchell A, Savill-Smith C. The use of computer and video games for learning: A review of literature. Learning & Skills Development Agency, Regent Arcade House 19–25 Argyll Street London W1F7LS (2004). ISBN 1-85338-904- 8: p.23.
3. Khalil S, Sultana F, Alim F, Muzammil K, Nasir N, Hasan A, Mahmood SE. Impact of Playing Violent Video Games Among School Going Children. Indian J Comm Health. 2019;31(3):331-337.
4. Gentile DA. Pathological video game use among youth 8 to 18: A national study. Psychol. Sci. 2009; 20: 594– 602
5. Liu Y, Teng Z, Lan H, Zhang X, Yao D. Short-term effects of prosocial video games on aggression: an event related potential study. Front Behav Neurosci. 2015; 9:193.
6. Groves C.L., Anderson C.A. (2017) Negative Effects of Video Game Play. In: Nakatsu R., Rauterberg M., Ciancarini P. (eds) Handbook of Digital Games and Entertainment Technologies. Springer, Singapore
7. World Health Organization, Regional Office for the Eastern Mediterranean. Excessive screen use and gaming during COVID – 19. [http://www.emro.who.int/images/stories/mnh/documents/1_en_infographic_screen_use_what_you_need_to_know.pdf?ua=1] (Assessed on 31st May’ 2020)
8. Kim P. Negative Effects of Video Games. Credit Donkey; March 31, 2019. <https://www.creditdonkey.com/negative-effect-video-games.html> [Assessed on May 3’ 2020]
9. Tannahill N, Tissington P, Senior C. Video games and higher education: what can "call of duty" teach our students?. Front Psychol. 2012;3:210.
10. Poli D., Berenotto C., Blankenship S., Piatkowski B., Bader G.A., & Poore M. "Bringing Evolution to a Technological Generation: A Case Study with the Video Game SPORE". American Biology Teacher;2012; 74 (2): 100–103.
11. "View of Using video games to combine learning and assessment in mathematics education"(http://journal.seriousgamessociety.org/index.php/IJSG/article/view/98/pdf_30).journal.seriousgamessociety.org. Retrieved 2018-11-05.
12. Bogost I. "The Rhetoric of Video Games." The Ecology of Games: Connecting Youth, Games, and Learning. Edited by Katie Salen. The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning. Cambridge, MA: The MIT Press, 2008. 117–140. doi: 10.1162/dmal.9780262693646.117
13. Prot S, Gentile DA, Anderson CA, Suzuki K, Swing E, et al. Long-term relations between prosocial media use, empathy, and prosocial behavior. Psychological Science 2014; 25: 358–368.
14. Anderson CA, Shibuya A, Ihori N, Swing EL, Bushman BJ, et al. Violent video game effects on aggression, empathy, and prosocial behavior in Eastern and Western countries. Psychological Bulletin 2010; 136: 151–173.

Conflicts of Interest: Nil Source of Funding: Nil

Citation: Muzammil K. Non-Violent Video Games: A Boon in COVID-19 Pandemic Era. National Journal of Medical and Allied Sciences 2020; 9(1): 1-3

Date of Submission: 31-06-2020

Date of Acceptance: 08-07-2020



STUDY OF PORTAL VEIN DIAMETER AND GRADES OF OESOPHAGEAL VARICES IN PATIENTS OF CIRRHOSIS OF LIVER WITH PORTAL HYPERTENSION

BP Priyadarshi¹, Imran Kamal Khan¹, Vinay Kumar¹, Ashok Kumar Verma², Tanu Midha³, Madhuri⁴ and Mahendra Singh⁵

¹ Department of Medicine, ² Department of Radiology, ³ Department of SPM, ⁴ Department of Cardiac Anaesthesia, ⁵ Department of Pathology GSVM Medical College, Kanpur, India.

ABSTRACT

Introduction: Cirrhosis of liver is a diffuse process of fibrosis that converts the liver architecture into structurally abnormal nodules. Portal hypertension leads to dilatation of portal vein, splenomegaly, and formation of portal systemic collaterals at different sites. This study was conducted to find out the correlation of portal vein diameter with gastro-oesophageal varices in diagnosed cases of cirrhosis of liver.

Material and Methods: This prospective cross sectional study was carried out among 100 patients of cirrhosis of liver with portal hypertension attending Gastroenterology, Medicine OPD and admitted in IPD, Department of Medicine, LLR & Associated Hospitals, GSVM Medical College, Kanpur during study period from January 2018 to October 2019. All patients previously or newly diagnosed with cirrhosis of liver with portal hypertension without history of hepatic encephalopathy, variceal bleeding, EVL, use of beta blockers, were selected for the study. Ultrasonography was performed in all cases to note the portal vein diameter. Routine blood testing including platelet count was done and UGI-Endoscopy was done to detect presence of varices with grades. Statistical analysis was done using SPSS for Windows version 17.0. The data obtained was analysed using mean, SD, Student's t-test and chi square correlation coefficient. P value <0.05 was considered significant.

Results: Ten patients had no varices (grade NIL) and the rest 90 patients had varices. Average portal vein diameter of patients without oesophageal varices was 11.25 ± 1.46 mm and of patients with varices was 14.67 ± 1.5 mm. The difference was highly significant ($p < 0.001$). There was a positive correlation between grading of oesophageal varices and portal vein diameter ($\chi^2 = 39.47$; $p < 0.001$).

Conclusion: The study depicts that with increase in portal vein diameter the chances of formation of higher grades of oesophageal varices also increases and also a positive association exists.

Keywords: Cirrhosis of liver, portal vein diameter, gastro-oesophageal varices.

Author for correspondence: Dr. Madhuri E-mail:priyadarshibp@yahoo.com

INTRODUCTION

Chronic liver disease develops when the functional capacity of the liver can no longer maintain normal physiological conditions. Some forms of liver diseases are non-progressive or only slowly progressive, other more severe forms are associated with scarring and architectural disorganization which if advanced, leads to cirrhosis. The scarring causes increased resistance to blood flow through the portal vein leading to ascites, oesophageal varices and increased morbidity and mortality.

Cirrhosis is a pathologically defined entity that is associated with a spectrum of characteristic clinical manifestations¹.

A large portal vein suggests portal hypertension. If collaterals are seen, this confirms portal hypertension. Sixty five per cent of cirrhotic patients with varices will not bleed within 2 years of diagnosis, but 50% will die of the first hemorrhage². Congestive splenomegaly is common in patients with portal hypertension.

Hypersplenism with thrombocytopenia is a common feature of patients with cirrhosis and is usually the first indication of portal hypertension³.

It is a well-known fact that portal vein diameter is usually increased in cirrhosis of liver with portal hypertension, and spleen is also enlarged in size. A few previously reported studies showed that there was a definite correlation between portal vein diameter and presence of gastro-oesophageal varices. Sarwar et al⁴ reported that patients with portal vein diameter more than 11 mm are more likely to have oesophageal varices. Another study by Dib et al⁵ showed that oesophageal varices developed when portal vein diameter exceeds 13 mm.

There is a strong correlation between variceal size assessed endoscopically, and the probability of bleeding.

The aim of our study was to study the association between portal vein diameter and grades of oesophageal varices in patients of cirrhosis of liver with portal hypertension.

MATERIAL AND METHODS

The prospective cross sectional study was carried out among 100 patients of cirrhosis of liver with portal hypertension attending Gastroenterology, Medicine OPD and admitted in IPD, Department of Medicine, LLR & Associated Hospitals, GSVM Medical College, Kanpur during study period from January 2018 to October 2019. Informed consent taken from all patients who enrolled in this study. The study protocol was approved by the institutional ethics committee review board.

Inclusion Criteria

- Previously diagnosed and newly diagnosed cases of cirrhosis of liver with portal hypertension.

Exclusion Criteria

- Patients suffering from hepatic encephalopathy
- Patients with previous history of portal hypertensive bleeding.
- Patients on previous or current treatment with beta blockers, diuretics or other vaso-active drugs. and
- Patients with previous history of sclerotherapy or banding for oesophageal varices. A thorough general and clinical examination was done and routine as well specific investigations were performed. Portal vein diameter measurement:

In normal individuals, the portal vein diameter does not exceed 13 mm in quiet respiration, measured where the portal vein crosses anterior to the IVC. This assessment is usually conducted with ultrasound views along the long axis of the portal vein. Diagnostic measurements were standardized by examining the patient in the supine position and in a state of quiet respiration.

Upper gastro-intestinal Endoscopy was performed in the department of Medicine, GSVM Medical College, Kanpur in all selected cases to look for gastro-oesophageal Varices and other associated signs of portal hypertension like red wale marks, cherry red spots. In patients with two different types of variceal grades, the higher variceal grade was considered for our study.

Grade 1: Small varices without luminal prolapse.

Grade 2: Moderate sized varices showing luminal prolapse with minimal obscuring of the gastro oesophageal junction

Grade 3: Large varices showing luminal prolapse subsequently obscuring the gastro oesophageal junction.

Grade 4: Very large varices completely obscuring the gastro oesophageal junction

Statistical Analysis: Statistical analysis was done using Statistical Package for Social Survey (SPSS) for Windows version 17.0. The data obtained was analysed using mean, SD, Student's t-test and chi square correlation coefficient. P value <0.05 was considered significant.

RESULTS

Majority of the patients belong to the age group of 40-49 years accounting for 35 % followed by 23% in the age group of 30-39 years. Among all 85% of the patients were male while 15% of the patients were females.

Approximately 90% of the patients were found to have oesophageal varices while 10% of the patients had no oesophageal varices.

In 76% of the patients have portal vein diameter more than 13 mm while 24% of the patients have portal vein diameter less than or equal to 13 mm.

About 48% of the patients were found to have grade 2 varices and 23% of the patients were found to have grade 3 varices while 19% of the patients were found to have grade 1 and no varices in 10 patients.

Table 1: Mean age of the Patients

Varices	No. of Patients	Mean Age in Years	Standard Deviation
VARICES PRESENT	90	47.4	10.96
NO VARICES	10	48.3	9.79

t=0.2486, p> 0.05(.8041), inference = non significant, L.L-U.L = -9.0 to + 0.89 (LL= lower limit ,UL=upper limit).

Mean age of the patients having varices was 48.3 with standard deviation of 10.96 and was not found to be statistically significant.

Table 2: Mean Portal Vein Diameter of The Patients

Varices	No. of Patients	Mean Portal Vein Diameter	Standard Deviation
VARICES PRESENT	90	14.67	1.5
NO VARICES	10	11.25	1.46

t=6.85, p<0.001, inference =highly significant

Mean portal vein diameter of the patients having varices is 14.67 with standard deviation 1.5 and was found to be highly significant .

TABLE 3: Correlation of Portal Vein Diameter and Grade Of Oesophageal Varices

Portal Vein Diameter (Mm)	Nil	Grade 1	Grade 2	Grade 3
≤13	10	6	7	1
>13	0	13	41	22
TOTAL	10	19	48	23

x²=39.47, df=3, p<0.001, inference =highly significant

From the above correlation it is evident that majority of the patients having higher grades of varices have portal vein diameter above 13 mm, accounting for 41 patients having grade 2 and 22 patients having grade 3 oesophageal varices.

DISCUSSION

Severe upper gastrointestinal bleeding as a complication of portal hypertension develops in about 30-40% of the patients with cirrhosis due to increased prevalence of chronic liver disease, variceal hemorrhage is associated with significant morbidity ,mortality and health care costs. Numerous studies have demonstrated the efficacy of

beta blockers for primary prevention of variceal bleeding in patients with high risk varices indicating the importance of screening for the presence of oesophageal varices⁶.

Current guidelines recommend that all cirrhosis patients should undergo endoscopic screening at the time of diagnosis to identify those at high risk of bleeding and likely to benefit from primary prophylaxis. This approach however, places a heavy burden on endoscopy units and the repeated testing over time can decrease patient compliance⁷.

Therefore, there is a particular need for non-invasive predictors for the presence of oesophageal varices to ease the medical social and economic burden of the disease. Many previous studies have documented significant correlation between various non endoscopic variables for the presence or absence of varices.

We conducted our study with study sample consisting of 100 patients of whom 85 were males and 15 were females. Males contributed about 85% of the study population. Incidence of cirrhosis was maximum in the age group 40-49 years (35%). Overall mean age was 47.5±10.8. Mean age in patients with oesophageal varices was 47.4 ± 10.96 as compared to 48.3 ± 9.79 in patients without oesophageal varices.

However the mean age was 51(range 20-80) in study by Baig et al ⁸, mean age was 42 (range 17-73) in a study by Cherian et al⁹, and in study by Sarangapani et al⁶ median age was 45 (range 18-74).Youngest patient in our study was 24 years and oldest was 72 years . In our study 23 % were in the age group of 30-39 years, closely followed by 22% in the age group of 50-59 years. Males predominated in each of the age group studied.

Among 100 patients studied 90% patients were found to have varices. Majority of the patients belonged to the category with portal vein diameter more than 13 mm accounting to about 76%. Mean portal vein diameter was 14.67 ± 1.5 in patients with oesophageal varices as compared to 11.25 ± 1.46 in patients without varices. 57% patients were found to have splenic diameter more than 13 cm as compared to 47% with 13 cm or less. Mean splenic diameter in patients with varices was 13.58 ± 1.73 as compared to 11.32 ± 1.9 in patients without varices.

Lopamudra Mandal et al¹⁰ (82 patients) found that twenty patients had no varices (grade 0) and the rest sixty-two patients developed varices. Average portal vein diameter of patients without gastro-oesophageal varices was 11.545 ± 1.514 mm and of patients with varices 13.998 ± 1.123 mm Average spleen size of patients without gastro-oesophageal varices was 13.129 ± 1.102 cm and with varices 14.997 ± 1.992 cm. In the study by Prihatiniet al¹¹, portal vein diameter 11.5 mm and spleen size of 10.3 cm were predictive factors for oesophageal varices in liver cirrhosis.

CONCLUSION

Measurement of portal vein diameter (> 13 mm) ultrasonographically is an independent non – invasive predictor of presence of Esophageal Varices in patients with cirrhosis with portal Hypertension.

This parameter can hence identify the subset of patients who require endoscopy for the prophylactic management of oesophageal varices. Apart from being non-invasive, measurement of portal vein diameter is a relatively inexpensive test as abdominal ultrasound would be obtained on all cirrhotic patients routinely as a part of their clinical workup.

This parameter can be used in predicting propensity to oesophageal varices non-invasively and thus help in starting prophylactic therapy earlier to prevent bleeding and other complications of varices.

REFERENCES

1. Bruce R. Bacon. Cirrhosis and its complications. Chapter 308. Harrison's principles of Internal Medicine 18th edition. McGraw-Hill. 2012 ;(949-951).
2. Sheila Sherlock, James Dooley. Hepatic Cirrhosis. Diseases of the liver and biliary system. 11th edition. Chapter 21 page (365- 380).
3. Bruce R. Bascon. Ch 308. Cirrhosis and its complication. Harrison Text Book of internal Medicine Vol.2,18/E, McGrawHill Publishers, 2012. pg 2592-2602.
4. Sarwar S, Khan AA, Alam A. Non-endoscopic prediction of presence of oesophageal varices in cirrhosis. J Coll Physicians Surg Pak 2005; 15 (9): 528-531.

5. Dib N, Konate A, Obesti F, Cales P. Non invasive diagnosis of portal hyper tension in Cirrhosis. Application to the primary prevention of varices. Gastroenterol. Clin Diol; 2005; 29(10); 975-987.
6. Sarangapani, Chitra S, Muthukumaran K, Balamurali R, Pugazhendhi T, and Jeevan KS, Saudi J Gastroenterol. 2010 Jan-Mar; 16(1): 38–42.
7. Rye K, Scott R, Mortimore G, Lawson A, Austin A, Freeman J. Towards non-invasive detection of oesophageal varices. Int. J Hepatol. 2012; 343-391.
8. Baig WW, Nagaraja MV, Varma M, Prabhu R. "Platelet count to spleen diameter ratio for the diagnosis of oesophageal varices: Is it feasible? Can J Gastroenterol 2008; 22(10): 825-828.
9. Cherian JV, Deepak N, Ponnusamy RP, Somasundaram A, Jayanthi V. Non-invasive predictors of esophageal varices. Saudi J Gastroenterol 2011; 17: 64-68
10. Lopamudra Mandal, Sanjay Kumar Mandal, Dipanjan Bandyopadhyay, Saumik Datta. Correlation of portal vein diameter and splenic size with gastro-oesophageal varices in cirrhosis of liver. JIACM 2011; 12(4): 266-270 .
11. Prihatini J, Lesmana LA, Manan C, Gani RA. Detection of oesophageal varices in liver cirrhosis using non-invasive parameters. Acta Med Indones. 2005 July-sept.; 37(3): 126-131.

Conflicts of Interest: Nil Source of Funding: Nil

Citation: Priyadarshi BP, Khan IK, Kumar V, Verma AK, Midha T, Madhuri and Singh M. Study of Portal Vein Diameter And Grades Of Oesophageal Varices in Patients of Cirrhosis Of Liver With Portal Hypertension. National Journal of Medical and Allied Sciences 2020; 9(1): 4-7

Date of Submission: 02-12-2019

Date of Acceptance: 21-12-2019



DETERMINANTS OF ANAEMIA AMONG PREGNANT WOMEN DELIVERED IN A RURAL TERTIARY CARE HOSPITAL IN SONIPAT: A CASE CONTROL STUDY

Sunny Ohlan¹, S K Jha², J P Majra³, Rajiv Mahendru⁴

Department of Community Medicine, Bhagat Phool Singh Government Medical College for Women, Sonipat – 131305(Haryana)

ABSTRACT

Introduction: Anaemia in pregnant women remains one of the most intractable public health problems in developing countries because of variety of causes and contributing factors including socio - economic conditions and increased risk of maternal and perinatal mortality.

Objectives: To identify the socio-demographic and obstetric determinants of anaemia among pregnant women delivered in a rural tertiary care hospital.

Methods: A hospital-based case control study conducted among 168 pregnant women delivered at our rural tertiary care hospital. An inclusion criterion for cases and controls was age of 18 years and above and residents of Sonipat district. Sociodemographic and Obstetrics factors were collected by using semi-structured questionnaires from study participants. Analysis was performed by using R statistical software. Odds Ratio, Chi Square and P value were calculated.

Results: The odds of getting anaemia in pregnant mother were significantly lower who visited 4 times and more than 4 times for antenatal care check-up as compare to those who had less than 4 visits (OR = 0.25, CI: 0.11 - 0.53) and (OR = 0.38, CI: 0.16 - 0.85) respectively. The odds of anaemia were 0.25 and 0.07 times lower among pregnant women who consumed iron folic acid tablets (IFA) up to three months and three to six months during their pregnancy respectively as compare to those who had never consumed (OR = 0.25, CI: 0.01 –1.56) and (OR = 0.07, CI: 0.03 - 0.44) respectively. No significant association was found with gravida, parity, abortion, birth interval and deworming treatment.

Conclusion: Number of antenatal care visits and consumption of iron folic acid tablets were found to be statistically significant factors associated with anaemia among pregnant women.

Keywords: Anaemia, pregnant women, determinants, case - control Study

Author for correspondence: Dr Sunny Ohlan, E-mail: SunnyOhlan30@gmail.com

INTRODUCTION

It is estimated that the global prevalence of anaemia in pregnant women is 38.2%.¹ India has reported high prevalence of anaemia in pregnancy and it is the second leading cause of maternal deaths in our country.² Prevalence of anaemia in pregnant women of India declined from 57.9% to 50.3% from National Family Health Survey (NFHS-3 to NFHS-4).³ According to (NFHS-4), 65.5% of pregnant women are anaemic in Sonipat district of Haryana.⁴ Risk factors which are associated with

maternal anaemia are teenage pregnancies, maternal illiteracy, unemployment, short pregnancy intervals, age of gestation, primigravida and multigravida, loss of appetite and excessive vomiting in pregnancy, malnutrition, unhealthy lifestyle, hemoglobinopathies, age (< 20 years or >35 years old), twin or multiple pregnancies, smoking or alcohol use, history of menstrual disorders or past infections.⁵⁻⁸

High prevalence of anaemia among pregnant women persists despite many meticulous efforts by

Government of India. Only National Programme cannot cut short the problem of anaemia, so knowledge of various determinants associated with anaemia will help to formulate strategies to attack this important public health problem and for policy making. This study was conducted to identify the various socio demographic and obstetric determinants associated with anaemia among pregnant women delivered in a rural community in Sonapat, Haryana.

MATERIAL AND METHODS

Study design

The study was a hospital-based case control study

Study area

The study was carried out in the Post-natal ward of Obstetrics & Gynaecology Department, Bhagat Phool Singh Government Medical College for Women (BPSGMCW), Khanpur Kalan, Sonapat, Haryana.

Study population

The study was conducted among pregnant women delivered at the hospital.

Inclusion criteria

All the willing delivered pregnant mothers residing in Sonapat district and who were above 18 years of age.

Exclusion criteria

Post-natal mothers who were not willing to participate in the study.

Sample size

The sample size was calculated using n Master software by considering the following assumptions: as per the NFHS-4 the frequency of 100 IFA consumption among anaemic mothers was 14%. To

detect odds ratio of 3 with 95% CI and 80% power, case to control ratio 1:1 and considering 10% non-response rate the total number of study participants were 168, of them, 84 cases and 84 controls were enrolled in the study.

Study period

The study was conducted for one year from March 2018 to February 2019.

Sampling Technique

Diagnosed cases of anaemia were selected by systematic random sampling and equal number of age matched controls with a difference of ± 2 years was taken, till sample size met.

Ethics Committee approval

Institutional Ethics Committee of BPS GMC (W) has approved to carry out this study.

Informed consent

Each participant was informed about the research objectives and written informed consent was taken from them.

Tool for data collection

A semi-structured interview schedule was used to collect the data related to socio-demographic as like age, caste, type of family, occupation and socio-economic status. Socio-economic status of the family was calculated by using Modified BG Prasad Classification. Data related to obstetric factors like gravida, parity and abortion, menstrual history, registration of pregnancy and birth interval was asked. Questions related to antenatal care, IFA tablet, deworming during pregnancy were also asked. Using the WHO definition for diagnosis of anaemia in pregnancy⁹, the pregnant women were categorized according to level of Hb less than 11gm% as "Case" and level of Hb more than 11gm% as "Control group", based on the Hb level

test result at the time of delivery as per hospital record.

Data collection & Statistical analysis

A hospital-based case control study which was carried out among 168 delivered pregnant mothers. All the data were coded & entered into computer in Microsoft excel 2007 spread sheet. Analyses were performed by using R statistical software. Data were presented in form of frequency and proportion for categorical variables. Odds Ratio, Chi Square, Fisher's exact test and P value were calculated.

RESULTS

Table-1 shows that majority 57 (67.9%) of cases and 49 (58.3%) of controls were in age group of 18-24 years. Mean age of cases and controls were 23 & 24 years respectively. Among the cases and controls in Joint family were 66 (79.5%) and 63 (75.0%) respectively and in nuclear family were 18 (21.5%) and 21 (25.0%) respectively. Maximum respondents were in Class III Socio economic status where 29 (48.3%) were cases and 31 (51.7%) were controls followed by Class II where cases and controls 24 (49.0%) and 25 (51.0%) respectively. Among the study subject it was found that 82 (97.6%) cases and 80 (95.2%) controls of the study subjects were housewives, while 2 (2.4%) cases were in government job and 4 (4.8%) controls were either in government job, private sector or were labourer.

The odds of developing anaemia in pregnant mother was three times and more than one time higher in those who had parity more than two and primi or second parity as compare to those who were nulliparous. (OR = 3.25, CI: 0.39 – 67.3) and (OR = 1.10, CI: 0.59 – 2.05) respectively. Maximum 65 (77.4%) of cases and 60 (71.4%)

controls had no history of abortion, while 16 (19.0%) cases and 21 (25.0%) controls had history of one abortion and 3 (3.6%) cases and 3(3.6%) controls had history of two & more abortion. The odds of getting anaemia in pregnant mothers who had birth interval < 2 years were 1.11 times more as compare to those ≥ 2 years birth interval (OR = 1.11, CI: 0.45 – 2.76). The odds of getting anaemia in pregnant mother were significantly lower who visited 4 times and more than 4 times for antenatal care check-up as compare to those who had less than 4 visits (OR = 0.25, CI: 0.11 - 0.53) and (OR = 0.38, CI: 0.16 - 0.85) respectively. The odds of getting anaemia in pregnant mothers who consume iron tablets during their pregnancy were 0.13 times lower than the odds of mothers who did not consume iron tablets during their pregnancy (OR = 0.13, CI: 0.016-1.102) and p value is 0.03 highly significant. The odds of anaemia were 0.25 and 0.07 times significantly lower among pregnant women who consumed iron folic acid tablets up to three months and three to six months during their pregnancy respectively as compare to those who had never consumed (OR = 0.25, CI: 0.01 – 1.56) and (OR = 0.07, CI: 0.03 - 0.44) respectively. The odds of getting anaemia in pregnant mothers who did not take deworming treatment during their pregnancy was 0.55 times lower than odds of mothers who took treatment (OR = 0.55, CI: 0.271-1.138). [Table-2]

Table 1: Association of Socio-demographic characteristics of study participants

Variable	Cases	Control	OR(95% CI)	P Value
	N (%)	N (%)		
Age				
18-24	57(67.9)	49(58.3)	2.6 (3.10 - 0.84)	0.108
25-31	24(28.6)	27(32.2)	2.5 (2.3 - 0.60)	0.239
>31	3 (3.5)	8 (9.5)	Ref	
$\chi^2 = 3.5; df = 2; P\text{-value} = 0.21$				
Caste				
Scheduled Caste	25(29.7)	28(33.2)	Ref	
Other Backward Class	27(32.2)	19(22.6)	1.59 (0.72 - 3.56)	0.25
Others	32(38.1)	37(44.2)	0.96 (0.47 - 1.98)	0.93
$\chi^2 = 1.92 df = 3; P\text{-value} = 0.38$				
Socio-economic status				
I	10(62.5)	6 (37.5)	Ref	
II	24(49.0)	25(51.0)	0.586(1.75-1.73)	0.350
III	29(48.3)	31(51.7)	0.535 (1.76-1.78)	0.317
IV	20(48.8)	21(51.2)	0.605 (1.79-1.75)	0.354
V	1 (50)	1 (50)	0.60 (0.006 - 54.8)	0.734
$\chi^2 = 1.11; df = 4; P\text{-value} = 0.89$				
Type of family				
Nuclear	18(21.0)	21(25.0)	Ref	
Joint	66(79.0)	63(75.0)	1.29 (0.62-2.70)	0.48
$\chi^2 = 0.30; df = 1; P\text{-value} = 0.58$				
Occupation				
Housewife	82(97.6)	80(95.2)	2.05(0.38-15.08)	0.4
Others*	2 (2.4)	4 (4.8)	Ref	
$\chi^2 = 0.69; df = 1; P\text{-value} = 0.40$ * represents government job and laborer				
Total	84(100)	84(100)		

Table 3: Iron consumption and deworming treatment among the study participants

Variable	Cases	Control	OR(95% CI)	P Value
	N (%)	N (%)		
Consumption of Iron tablets				
Yes	77 (91.7)	83(98.8)	0.13(0.016-1.102)	0.061
No	7 (8.3)	1 (1.2)	Ref	
$\chi^2 = 4.72; df=1; P\text{-value} = 0.030$				
Duration in Months				
Never taken	7 (8.3)	1 (1.2)	Ref	
Up to 3 months	47 (56.0)	26(31.0)	0.25 (0.01 - 1.56)	0.21
>3-6 months	30 (35.7)	57(67.9)	0.07 (0.03 - 0.44)	0.01
$\chi^2 = 18.9; df = 2; P\text{-value} = 0.02$				
Deworming Treatment				
Yes	16 (19)	25(29.8)	Ref	
No	68 (81)	59(70.2)	0.555 (0.271-1.138)	0.108
$\chi^2 = 2.61; df=1; P\text{-value} = 0.106$				
Total	84(100)	84 (100)		

Table 2: Association of obstetric characteristics of the study participants

Variable	Cases	Control	OR(95% CI)	P Value
	N (%)	N (%)		
Parity				
0	36(42.8)	39(46.4)	Ref	
1-2	45(53.6)	44(52.4)	1.10(0.59 - 2.05)	0.744
More than 2	3 (3.6)	1 (1.2)	3.25(0.39 - 67.3)	0.31
$\chi^2 = 1.13; df = 2; P\text{-value} = 0.56$				
Gravida				
1	33(39.3)	31(36.9)	1.29 (0.62-2.72)	0.49
2	28(33.3)	25(29.8)	1.36 (0.63-2.96)	0.43
3 & above	23(27.4)	28(33.3)	Ref	
$\chi^2 = 0.7; df = 2; P\text{-value} = 0.69$				
Abortion				
0	65(77.4)	60(71.4)	Ref	
1	16(19.1)	21(25.0)	0.70(0.33 -1.46)	0.35
2 & More	3 (3.5)	3 (3.6)	0.92(0.16 -5.15)	0.92
$\chi^2 = 0.87; df = 2; P\text{-value} = 0.64$				
History of Menstrual Cycle				
Regular	81(96.4)	81(96.4)	1.0 (0.19-5.10)	1.0
Irregular	3 (3.6)	3 (3.6)	Ref	
Fisher's exact test = 1; df = 1; P-value = 1				
Excess Menstrual Bleeding				
Yes	5 (6.0)	4 (4.8)	Ref	
No	79(94.0)	80(95.2)	1.26 (0.32-4.88)	0.73
$\chi^2 = 0.11; df = 1; P\text{-value} = 0.73$				
Pregnancy Registered				
Yes	79(94.0)	83(98.8)	0.19 (0.02-1.66)	0.13
No	5 (6.0)	1 (1.2)	Ref	
$\chi^2 = 2.76; df = 1; P\text{-value} = 0.096$				
Birth Interval				
Not Applicable	33(39.3)	33(39.3)	1.36 (0.54-3.46)	0.507
<2 Years	40(47.6)	36(42.9)	1.51 (0.62-3.7)	0.365
>=2Years	11(13.1)	15(17.9)	Ref	
$\chi^2 = 0.826; df = 2; P\text{-value} = 0.662$				
Number of Antenatal care service visit				
<4 visits	37(69.8)	16(30.2)	Ref	
4 visits	22(46.8)	25(53.2)	0.38 (0.16-0.85)	0.020
>4 visits	25(36.8)	43(63.2)	0.25 (0.11-0.53)	0.0004
$\chi^2 = 13.27; df = 2; P\text{-value} = 0.001$				
Month of starting Antenatal care service visit				
Never	1 (1.9)	0	14.9 (2.12-NA)	0.987
< 3 months	19(22.6)	22(26.1)	0.56 (7.28-3.53)	0.542
3-6 months	59(70.2)	59(70.2)	1.02 (1.23-6.88)	0.982
6-9 months	5 (5.9)	3 (3.5)	Ref	
$\chi^2 = 3.691; df = 3; P\text{-value} = 0.297$				

DISCUSSION

The present study was conducted in a rural tertiary care hospital, Khanpur Kalan, Sonipat with the objective to find out the socio-demographic and obstetrics determinants of pregnant women delivering at a tertiary care hospital in Haryana.

In our study, pregnant women aged below 25 years were more anaemic compared to those mothers above aged 25 years. A study conducted by Manjunath S et al., 2013 at Hasan Karnataka, 56 %

women were in age group 21 to 29 years and 42 % in age group 18 to 20 years.¹⁰ This study is in agreement with the previous studies conducted in Dehradun district of Uttarakhand by (Singh A.B et al., 2009) which found higher proportion of anaemia among 20-30 years age group.¹¹ In contrast to our study, Okube T.O et al., 2016 in Kenya, found that the odds of anaemia were observed to rise as maternal age advances.¹² This may be due to the fact that early marriage and child bearing cause mother's increased requirement of haemoglobin in the already growing period of age. In present study, the Odds of anaemia were 2 times insignificantly more among housewives. Similar findings were reported in a study conducted by Singh R et al., 2019 where 92% cases and 90% controls were housewives and 8% cases and 10% controls they were working or in job.¹³ Our findings are in contrast with Okube T.O et al., 2016 in Kenya. They found that the proportion of anaemia was significantly more among employed participants as compared to the housewives.¹¹ This may be due to less exposure to knowledge & food gap and tradition that housewives usually eat at last in the family which may lead to aggravate anaemia. In present study, the Odds of anaemia were 1.29 time more in Joint family. The study conducted by Bisoi S. et al. in 2011 at West Bengal where anaemia was found 61.6 % and 78.5 % in nuclear and joint family respectively.¹⁴ Another study in (Udupi) conducted by Noronha JA et al., 2008 where prevalence of anaemia was found 51 % in nuclear family and 49.87 % in joint family.¹⁵ Reason for such findings in this study may be due to Industrialization has not affected this rural population. Because of rural area, people are more likely to live in joint family. In the present study,

maximum respondent in both cases and controls had registered their pregnancy. Similar to the present study, Bandiwad et al., 2016 had observed 6.7% of unbooked (not registered) cases and 1.7% of booked (registered) cases had severe anaemia.¹⁶ In a prospective case control study conducted by Singh R et al., 2019 severe anaemia was significantly more in unbooked (not registered) women.¹¹ This may be due to because of Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) on 9th of every month is working well in our area through which the pregnant women they contacted the ANM and ASHA's and get registered them. In our study, Iron-folic acid intake was significantly high in control compared to cases, 98.8% versus 91.7%. Also another study conducted by Abiselvi et al., 2018 in Tamil Nadu who had revealed an association between iron and folic acid tablet consumption and anaemic status.¹⁷ A prospective case control study by Singh R et al., 2019 found that Iron-folic acid intake was significantly high (90% versus 72%) and women were more compliant (80% versus 38%) in group of Non Anaemic compared to group of Anaemic.¹¹ Such findings in our study, may be due to that Iron deficiency occurs if the amount of iron absorbed is too little to meet the body's demand. This may be due to insufficient iron intake, reduced bioavailability of dietary iron intake or increased iron requirements during pregnancy. Declining levels of Hb concentrations accompanied by the decreasing of serum levels of vitamin A, ascorbic acid, folate and B12 and multiple vitamin deficiencies have been associated with severe anaemia in pregnant mothers. In our study, 47.6% cases and 42.9% controls had birth interval < 2 years i.e. followed by those pregnant mother that had not applicable to this birth interval category

while rest 13.1% cases and 17.9% controls had ≥ 2 years birth interval between current pregnancy. Similar findings to our study, Ali M M et al., 2019 at Tanzania in a cross sectional study revealed that pregnant women who had birth interval of less than two years were three times more likely to have anaemia compared to those with birth interval of more than two years.¹⁸ Reason for such findings in our study might be related with decreased iron store of women due to occurrence of pregnancy in rapid sequence between subsequent pregnancies while during this period the requirements are substantially higher than the average.

CONCLUSION

The present study concluded that ante natal care visit and consumption of iron folic acid tablet were found significant factors associated with anaemia among delivered pregnant mothers.

RECOMMENDATIONS

There is need for interventions such as mass media campaign, outreach education on more than four visits should be recommended with minimum being four visits should be ensured. Opportunity for visits should be used for ensuring of consumption of more than one dose of IFA tablets per day, according to level of Hb or level of anaemia. We recommend further community-based studies to identify other risk factors of anaemia associated with pregnant women with large sample size and more study design should be conducted.

ACKNOWLEDGEMENT: We are also thankful to all nursing staff and study participants' women for their support, co-operation and participation

during data collection and for sharing their experiences.

REFERENCES

1. World Health Organization. The Global Prevalence of Anaemia in 2011. Geneva: World Health Organization; 2015.
2. Kalaivani K, Ramachandran P. Time trends in prevalence of anaemia in pregnancy. *Indian J Med Res.* 2018; 147(3):268.
3. Varghese JS, Swaminathan S, Kurpad AV, Thomas T. Demand and supply factors of iron-folic acid supplementation and its association with anaemia in North Indian pregnant women. *PLoS One.* 2019;14(1):e0210634
4. International Institute for Population Sciences. National Family Health Survey-4, State fact sheet Haryana, 2015-16: India. Mumbai: IIPS; 2016. Retrieved from: http://rchiips.org/NFHS/pdf/NFHS4/HR_FactSheet.pdf.
5. Haniff J, Das A, Onn LT, Sun CW, Nordin NM, Rampal S, et al. Anemia in pregnancy in Malaysia: a cross-sectional survey. *Asia Pacific Journal of Clinical Nutrition.* 2007;16(3):527-36.
6. Noronha JA, Bhaduri A, Bhat HV, Kamath A. Maternal risk factors and anaemia in pregnancy: a prospective retrospective cohort study. *Journal of Obstetrics and Gynaecology.* 2010;30(2):132-6.
7. Fareh OI, Rizk DE, Thomas L, Berg B. Obstetric impact of anaemia in pregnant women in United Arab Emirates. *Journal of obstetrics and gynaecology.* 2005;25(5):440-4.

8. Baysal E. Molecular basis of β -thalassemia in the United Arab Emirates. *Hemoglobin*. 2011;35(5-6):581-8.
9. Benoist BD, McLean E, Egli I, Cogswell M. Worldwide Prevalence of Anaemia 1993–2005, 2008. Geneva World Health Organization
10. Manjunatha S. Total Dose Infusion of Fractionated Iron Dextran Complex In Management Of Anaemia In Antenatal Cases” In Aims Rural Teaching Hospital. [Dissertation]. RGUHS; 2005.
11. Singh AB, Kandpal SD, Chandra R, Srivastava VK, Negi KS. Anaemia amongst pregnant and lactating women in district Dehradun. *Indian J Prev Soc Med*. 2009; 40(1):19-22.
12. Okube OT, Mirie W, Odhiambo E, Sabina W, Habtu M . Prevalence and Factors Associated with Anaemia among Pregnant Women Attending Antenatal Clinic in the Second and Third Trimesters at Pumwani Maternity Hospital, Kenya. *Open Journal of Obstetrics and Gynecology*, 2016;6:16-27
13. Singh R, Gupta M, Saini V. Pregnant women with severe anaemia reporting in labor: prevalence, socio-demographic and obstetric determinants. *International Journal of Community Medicine and Public Health*. 2019; 6(2):701-7.
14. Bisoi S, Haldar D, Majumdar TK, Bhattacharya N, Sarkar GN, Ray SK. Correlates of anaemia among pregnant women in a rural area of West Bengal. *Journal of Family Welfare* 2011;57(1):72-78.
15. Noronha JA, Bhaduri A, Bhat HV. Prevalence of anaemia among pregnant women: a community-based study in Udupi district. *Health and population; perspectives and issues*. 2008;(1):31-40.
16. Bhandiwad A, Gowda SL, Anupama NK. Impact of socio demographic factors on the severity of maternal anaemia. *Int J Reprod Contracept Obstet Gynecol*. 2016; 5(3):868-72.
17. Abiselvi A, Gopalakrishnan S, Umadevi R, Rama R. Socio-demographic and obstetric risk factors of anaemia among pregnant women in rural Tamil Nadu. *International Journal of Community Medicine and Public Health*. 2018;5(2):721-7.
18. Ali MM, Ngowi AF, Gibore NS. Prevalence and obstetric factors associated with anaemia among pregnant women, attending antenatal care in Ungujaisland, Tanzania. *International Journal of Community Medicine and Public Health*. 2019;6(3):950-7.

Conflicts of Interest: Nil Source of Funding: Nil

Citation: Ohlan S, Jha SK, Majra JP, Mahendru R. Determinants Of Anaemia Among Pregnant Women Delivered In A Rural Tertiary Care Hospital In Sonipat: A Case Control Study. National Journal Of Medical And Allied Sciences 2020; 9(1): 8-14

Date of Submission: 14-02-2019

Date of Acceptance: 21-02-2020



COMPARISON OF ZIEHL – NEELSEN(ZN) STAINING AND FLUORESCENT(FL) STAINING IN SUSPECTED CASES OF TUBERCULOSIS

Rekha Bhandari¹, Dushyant Singh Gaur², Aarti Kotwal³, Anuradha Kusum⁴

^{1,2}Department of Pathology, SRHU, Jollygrant, Dehradun, ³Department of Microbiology, SRHU, Jollygrant, Dehradun, ⁴ Department of Pathology, SRHU, Jollygrant, Dehradun

ABSTRACT

Introduction: Early diagnosis of tuberculosis is important for therapeutic reasons and to control the spread of infection. Culture of *M. tuberculosis* is the gold standard method for the diagnosis of TB. However, culture is a slow process requiring specialized laboratories and skilled staff. Hence there is a need for a rapid, cheaper and effective technique for the detection of the tubercle bacilli.

Material & Methods: A total of 200 clinically suspected cases of tuberculosis were included in the study. All the cytological specimens procured were smeared and stained for both ZN and FL staining. A part of the sample was used for Lowenstein Jensen (LJ) culture. Patients on ATT were excluded from the study.

Results: The maximum cases were in the age group of 21-30 years. In 57% cases, patients were male with M:F ratio of 1.3:1. The sensitivity of FL(95.83%) was more as compared to ZN(91.67%). The difference in the case detection rate was statistically significant with p value 0.001. The average time taken to screen per slide by ZN was more (4.32mins) as compared to that by FL (2.28mins), reflecting a time saving by 47%.

Conclusion: FL staining has an upper edge in respect to efficacy, time saving and less observer fatigue. Hence replacement of the age old ZN technique and using FL microscopy may be considered as alternative for diagnosis of tuberculosis

Key words: Ziehl-Neelsen, fluorescent, tuberculosis, culture.

Author for correspondence: Dr. Rekha Bhandari Gaur, E-mail: rekha967@gmail.com

INTRODUCTION

As per the World Health Organization (WHO), tubercular infections are presently spreading at the rate of one person per second per million people, with three millions dying from it¹. Early diagnosis of tuberculosis is important for therapeutic reasons and to control the spread of infection². Culture of *M. tuberculosis* is the gold standard method for the diagnosis of TB³. However, culture is a slow process requiring specialised laboratories and highly skilled staff. In developing countries like India with a high tuberculosis burden and limited number of adequate resources and infrastructure, the diagnosis of Tuberculosis relies mostly on smear microscopy for Acid Fast Bacilli (AFB), however its sensitivity is considered to be low in paucibacillary cases⁴. Although several research groups have investigated the clinical validity and

differences in efficacy of various staining methods, the technical and procedural factors can influence the sensitivity of each staining technique. Moreover, very little previous literature related to the comparison of Auramine-o stained smears under fluorescent microscopy with ZN stain for detection of tubercle bacilli in cytological specimens is available till date. Hence, in view of above perspective, the present comparative study has been designed to assess the efficacy of Ziehl-Neelsen staining method versus fluorescent staining in the detection of mycobacterium from various cytological specimens of suspected cases of tuberculosis.

MATERIAL & METHODS

The study was conducted in the Cytology unit of Department of Pathology in collaboration

with Department of Microbiology over a period of 12 months after obtaining approval from the institutional ethical committee.

Inclusion Criteria

A total of 200 consecutive suspected cases of tuberculosis were included in the study.

FNAC of lymph node, irrespective of age and gender with suspicious clinical history or radiological evidence were included in the study along with other body fluids.

Exclusion Criteria

Pre-diagnosed cases already on anti-tubercular therapy

Ziehl-Neelsen and Auramine-o staining (Sigma-Aldrich) was done as per Standard Operating Protocol. Grading of the smears was done as per the RNTCP guidelines. Culture on L-J media was done to compare the two staining procedures.

Interpretation and analysis of obtained results was carried out using software SPSS version 20 and appropriate statistical test were employed

RESULTS

In the present study, 57% cases (n =114) were males and 43% (n=86) were females with male to female ratio of 1.3:1. Maximum number of cases (n=52/200; 26%) were in the age group of 21-30 years [Figure 1].

The most common presenting complaint of the cases was fever (n= 177/200; 88.5%) followed by malaise (n= 115; 57.5%) and cough (n=109 ; 54.5%).Maximum number of cases were lymph node aspirates (n=79; 39.5%) followed by pleural fluid (n=45; 22.5%) and pus (n= 44; 22%). There was one case each of Endotracheal tube secretions and Trans Bronchial Needle Aspiration.

Cervical lymph node was the most frequently aspirated lymph node (n=71; 71%) followed by supraclavicular lymph node(n=11; 11%).The maximum number of positive cases was seen in Cervical lymph node (n=13), followed by two cases each of breast lump and vertebral aspirate.

Of the 200 samples processed, a total of 25 cases were positive either on ZN [Figure 2] or FL[Figure 3], majority of the cases (92%, n=23) were paucibacillary. The multibacillary cases were diagnosed equally by both the staining methods, however the only true positive case diagnosed in addition on FL was paucibacillary.

The isolation rate by LJ culture was 12 % (24/200) [Figure 4]. The difference in case

detection rates by ZN and FL is statistically significant with p-value 0.001 by Z-test.

Figure 1: Age wise distribution of cases (n=200)

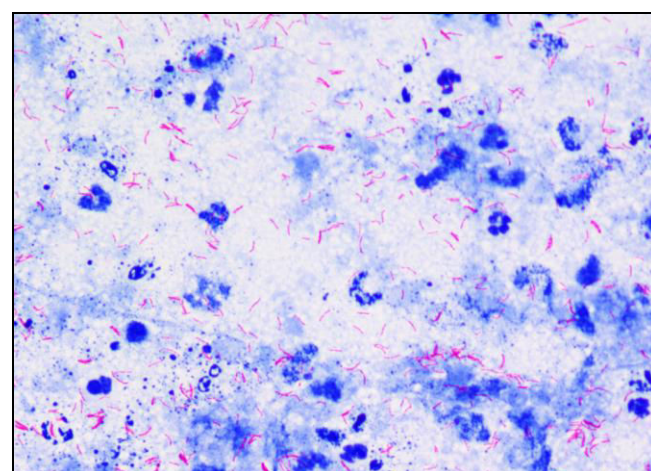
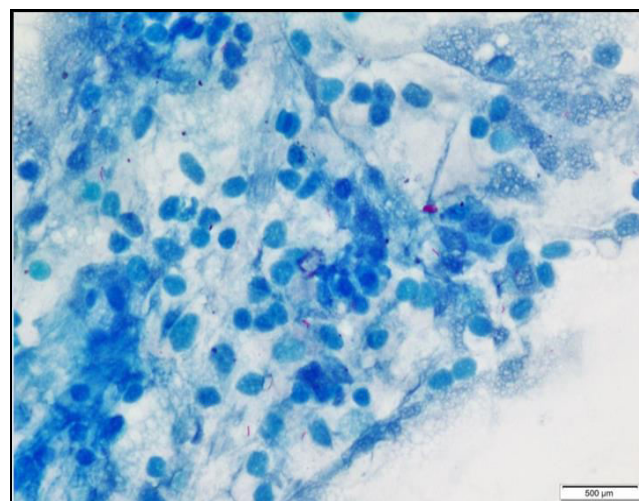
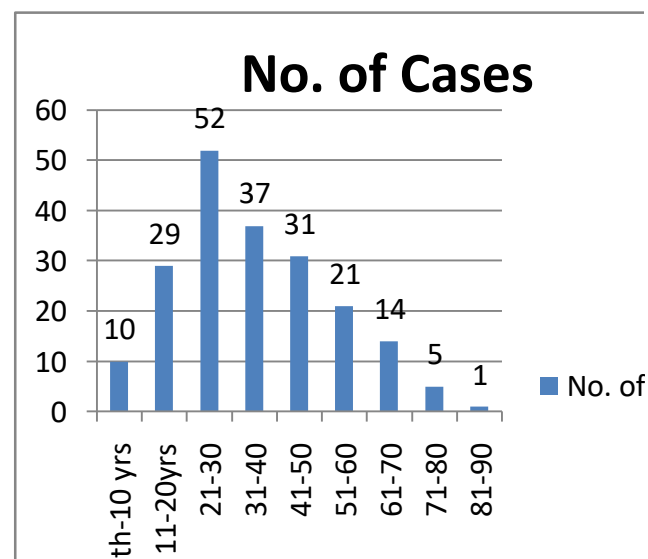


Figure 2: (A) - Paucibacillary case on ZN staining at 100x (oil immersion view) (B) - Multibacillary case on ZN staining at 100x (oil immersion view)

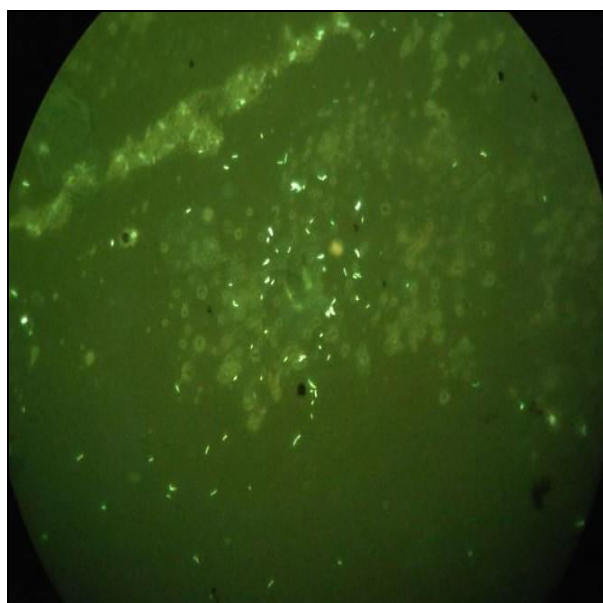
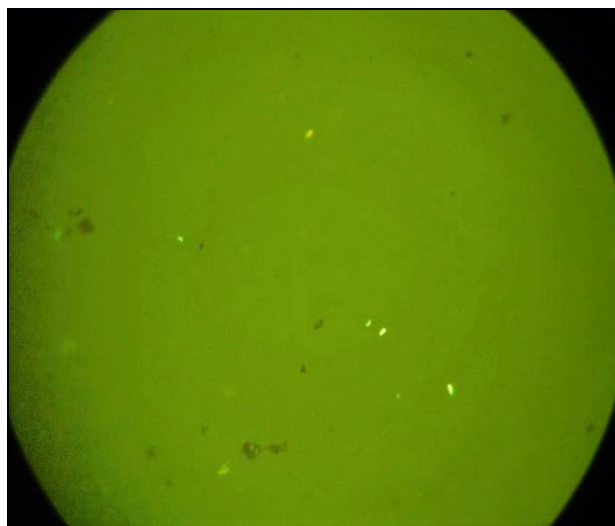


Figure 3: (A) –Paucibacillary case on FL staining at 40x (high power view) (B) - Multibacillary case on FL staining at 40x(high power view)



Figure 4: Lowenstein- Jensen medium slant showing buff coloured and rough colonies of the tubercle bacilli.

Table 1: Test Results

Results	ZN	FL
TRUE POSITIVE	22	23
TRUE NEGATIVE	175	174
FALSE POSITIVE	01	02
FALSE NEGATIVE	02	01

Table II. Comparison of ZN & FL stain

Characteristics	ZN	FL
SENSITIVITY = $\frac{TP}{TP+FN}$	91.67%	95.83%
SPECIFICITY = $\frac{TN}{TN+FP}$	99.43%	98.86%
POSITIVE PREDICTIVE VALUE(PPV) = $\frac{TP}{TP+FP}$	95.65%	92%
NEGATIVE PREDICTIVE VALUE(NPV) = $\frac{TN}{TN+FN}$	98.87%	99.43%
SMEAR POSITIVITY	(23/200) = 11.5%	(25/200) = 12.5%
ACCURACY	98.5%	98.5%
AVERAGE TIME TAKEN /SLIDE	4.32 mins	2.28 mins

TP = True Positive, TN = True Negative, FP = False Positive, FN = False Negative

Table III. Efficacy of ZN & FL in case detection

Variable	DISEASE POSITIVE (CULTURE POSITIVE)	DISEASE NEGATIVE (CULTURE NEGATIVE)
ZN POSITIVE	22	01
FL POSITIVE	23	02

DISCUSSION

Smear microscopy remains the crux for diagnosis of TB. However, the search for rapid and efficient staining methods continues.

In our study, the smear positivity rate of AO stained smears (12.5%) were better than ZN stained smears (11.5%)[Table 2].

The findings were comparable with those observed by Golia S et al⁵, Suria J et al⁶ and Ulukanligil et al⁷ where the smear positivity rates by ZN were 10.41%, 12.4%, 9.89% and FL were 16.56%, 19.1%, 12.47% respectively.

In the present study, fluorescent microscopy detected additional two positive cases which would have been missed by ZN microscopy alone. However one of them turned out to be negative on culture reflecting either a false positive result or might be an outcome of harsh decontamination of the sample accounting to loss of the viable bacilli⁸.

The major strength of our study was comparing the staining methods with culture which is considered as Gold standard for the diagnosis of mycobacterial infection. The sensitivity and specificity of both the staining methods was calculated by comparing the culture results, which adds to the strength to the evidence to the values.

Large number of studies showed that sensitivity of ZN ranged from 32% to 94% and fluorescence microscopy was on average 10% more sensitive than ZN⁹.

In the present study, sensitivity of ZN came out to be 91.67 % as compared to 95.83% of FL [Table 2]. Similar results were obtained by SJ Murray et al (93% by FL and 73% by ZN)¹⁰, K. Prashanthi et al (69% by FL and 50% by ZN)¹¹, A. Jain et al (41% by FL and 32% by ZN)¹², Githui et al (80% by FL and 65% by ZN staining)¹³ and Ulukanligil et al (85.2% by FL and 67.6% by ZN)⁷.

It may be because organisms in FL stain offer better contrast, appearing as brilliant yellow against a dark background. The use of this staining even by some colour blind investigator can be an additional advantage of this technique.

Lower specificity of FL microscopy compared with conventional light microscopy has been reported previously¹⁴. In the present study, the specificity of FL microscopy (98.86%) was slightly lower than that of ZN microscopy (99.43%)[Table 2]. Scanty AFB results on FL

microscopy were less likely to be associated with a positive culture result. It is thus more likely that mycobacteria from paucibacillary specimens were killed during decontamination process and failed to grow in culture⁸.

False positivity of ZN microscopy and FL fluorescent microscopy is 0.5% (1/200) and 1.0% (2/200) respectively, reported in our study which is not significant. The reasons for false positivity may be specimen from patients on anti-tubercular treatment or processing a bloody sample¹⁵. The ZN method is also known to give occasional false positive results¹⁶, probably because of the heating step involved in it¹⁷.

In the present study the statistical difference between case detection rates by the two stains was statistically significant (p value < 0.05) [Table 3].

This was in concordance with studies done in India by Mistry Y et al¹⁸, Jain A et al¹², Dagar V et al¹⁹ as well as abroad by Zailani S B et al²⁰ and Zaib-un –Nisa et al²¹ where all of them reported a statistically significant difference between case detection by the two staining techniques.

However findings by Subramani P et al²² was in discordance with the present study stating no significant difference between results of the two staining methods.

The sensitivity of smear microscopy is largely determined by the duration of microscopic examination¹. In high work load settings, the amount of time spent on examining each smear by conventional ZN is low which would probably compromise the sensitivity.

The advantage of fluorescence microscopy is the possibility to scan a smear at 400x magnification rather than at 1000x magnification, allowing theoretical reduction of examination time of the same area to one sixteenth as the surface increases by the square of the diameter. Practically the examination time is reduced to about 10 fold with Fluorescent compared to bright-field microscopy using a 3- fold different²³ magnification (400xVs 1000x).

In the present study the average time taken to screen per slide by ZN was more (4.32 mins) as compared to that by AO (2.28 mins), reflecting a time saving by 47% [Table 2].

In a study by Tiwari et al²⁴ the mean reading time of Auramine O technique was three times faster than the ZN technique with very good acceptance by the technicians. This was similar to the observation by Marais BJ et al²⁵, where he

observed 1.4 minutes to process a slide by FM as compared to 3.6 minutes with conventional ZN microscopy, reflecting a time saving of 61% with FM. Since it is less time consuming hence more slides can be processed in a shorter duration of time.

Despite the fact that conventional fluorescent microscopy has documented higher sensitivity than ZN in huge number of studies and has tremendous potential to reduce laboratory workloads²⁶, still its incorporation in routine practice has been hampered by various factors including complexity of the microscope, need for a dark room and perceived health risks associated with ultraviolet light exposure²⁷.

CONCLUSION

Our findings indicate that FL staining techniques is more effective as far as diagnosis of the disease is concerned, particularly in paucibacillary cases. Taking other factors into account, FL staining has an upper edge in respect to time saving and less observer fatigue. Hence replacement of the age old ZN technique by using FL microscopy may be considered as alternative for diagnosis of tuberculosis after conducting large scale feasibility studies in Indian settings.

Cost issues, however, cannot be ignored which was the short coming of this study.

REFERENCES

1. Ba F and Rieder HL. A comparison of fluorescence microscopy with the Zeihl – Neelson technique in the examination of sputum for acid-fast bacilli, *Int J Tuberc Lung Disease*. 1999; 3 (12): 1101-5.
2. Deshmukh SR, Mantri SB, Kendre PB and Nagoba BS. A comparison of sputum examination for acid fast bacilli by modified Schaeffer and fulton stain, Zeihl- Neelson stain and cold chain, *Indian J Med Res*. 1996; 103; 294-5.
3. Kumar V, Abbas AK, Fausto N, Mitchell RN. *Robbins Basic Pathology*. 8th ed. Philadelphia: Saunders Elsevier; 2007.
4. Hooja S, Pal N, Malhotra B, Goyal S, Kumar V, Vyas L. Comparison of ZiehlNeelsen&Auramine O staining methods on direct and concentrated smears in clinical specimens. *Indian Journal of Tuberculosis*. 2011; 58(2): 72-6.
5. Golia S, Hittinahalli V, A.R N, K.T S, Kamath B. A. A comparative study of Auramine staining using LED Fluorescent microscopy with Ziehl- Nelson staining in the diagnosis of pulmonary tuberculosis. *Journal of Evolution of Medical and Dental Sciences*. 2013;2(20):3450-3456.
6. J S, C C, S R. Comparison of conventional and fluorescent staining methods in diagnosis of pulmonary tuberculosis among HIV seropositive individuals. *Journal of Evolution of Medical and Dental Sciences*. 2012;1(4):463-466.
7. Ulukanligil M, Aslan G, Tasci S. A comparative study on the different staining methods and number of specimens for the detection of acid fast bacilli. *MemInstOswaldo Cruz*. 2000; 95: 855-58.
8. Abdissa K, Tadesse M, Abdella K, Bekele A, Bezabih M, Abebe G. Diagnostic performance of fluorescent light-emitting diode microscopy for tuberculous lymphadenitis in a high-burden setting. *Tropical Medicine & International Health*. 2015;20(11):1543-1548.
9. Desai K, Malek S, Mehtaliya C. Comparative study of Z-N staining v/s fluorochromestain from pulmonary and extrapulmonary tuberculosis. *Gurajat Medical Journal* 2009; 64 (2) 32-34
10. Murray S. Optimisation of acid fast smears for the direct detection of mycobacteria in clinical samples. *Journal of Clinical Pathology*. 2003;56(8):613-615.
11. Prasanthi, K, Kumari, A. Efficacy of fluorochrome stain in the diagnosis of pulmonary tuberculosis co-infected with HIV. *Indian Journal of Medical Microbiology*, 2005; 23(3): 179-85.
12. Jain A, Bhargava A, Agarwal S. A comparative study of two commonly used staining techniques for acid fast bacilli in clinical specimens. *Indian J Tuberc* 2002; 49:161–162.
13. Githui W, Kitui F, Juma ES, Obwana DO, Mwai J, Kwamasga D. A comparative study on the reliability of the fluorescence microscopy and Ziehl- Neelsen method in the diagnosis of pulmonary tuberculosis. *East Afr Med J*.1993;70: 263-6.
14. Thakur B, Mehrotra R, Nigam J. Correlation of Various Techniques in Diagnosis of Tuberculous Lymphadenitis on Fine Needle

- Aspiration Cytology. Pathology Research International. 2013;2013:1-4.
15. Somoskovi A, Hataling JE, Fitzgerald M, O'Donnell D, Parsons LM, Salfinger M, Lessons from proficiency testing event for acid fast microscopy. *Chest* 2001;120:250-57.
 16. Toman K. Tuberculosis case finding and chemotherapy. Questions and Answers 1st ed Geneva:WHO.1979.
 17. Gokhale S, Qadir S, Nagraj JS and AK Chakraborty. Efficiency of cold staining method of AFB in sputum: A comparison of ziehl – neelsen method under field conditions. *Int J Tuberc Lung Dis*,1990;37:135.
 18. Mistry Y, Rajdev S, Mullan S. Comparative Study of Z N Staining vs. Fluorochrome Staining and Impact of Sample Processing on Diagnosis of Tuberculosis from Various Clinical Samples. *Advances in Microbiology*. 2016;06(13):953-958.
 19. Dagar V, Heda S, Barsagade A, Mahore S, Ambhore N, Karyakarte R et al. Comparison of ZN Staining and Fluorescent Microscopy in Detection of Acid Fast Bacilli in Fine Needle Aspiration Smears. *IOSR Journal of Dental and Medical Sciences*. 2016;15(08):79-84.
 20. Zailani S B, Gabdo A H, Bukbuk D N, et al. Detection Rates of Ziehl-Nelsen Staining Technique and Fluorescent Microscopy in The Examination of Sputum for Acid Fast Bacilli. *Bo Med J* 2012;9(2) 27 – 30.
 21. Zaib-un-Nisa, Javed H, Zafar A, Qayyum A, Rehman A, Ejaz H.. Comparison of fluorescence microscopy and Ziehl-Neelsen technique in diagnosis of tuberculosis in paediatric patients. *J Pak Med Assoc* 2015;65(8):879-881.
 22. Subramani P, Venkateswarao T, Malligere Lingaiah H, Madappa B. Evaluation of multiple laboratory methods in the diagnosis of extrapulmonary tuberculosis. *International Journal of Medicine and Public Health*. 2014;4(4):482.
 23. Smithwick RW. Laboratory manual for acid-fast microscopy. 2nd ed Atlanta GA, USA: US Public Health Service, 1976.
 24. Tiwari V.K., Gupta N, Bansal S. A Comparative Study of the diagnostic yield of Fluorescent and Ziehl Neelsen Staining Techniques with the reference to the diagnosis of Pulmonary Tuberculosis. *International Journal of Scientific Research*. 2015; 251-252.
 25. Ben J. Marias, Wendy Brittle, KatrienPainczyk, Anneke C. Hesseling, NuldaBeyers, Elizabeth Wasserman, Dick van Soolingen and Rob M Warren; Use of Light – emitting diode fluorescence microscopy to detect acid fast bacilli in sputum. *Clinical infectious diseases* 2008; 47:203-7.
 26. . Ramsay A, Cuevas L, Mundy C, Nathanson C, Chirambo P, Dacombe R et al. New Policies, New Technologies: Modelling the Potential for Improved Smear Microscopy Services in Malawi. *Plus one*. 2009;4(11):e7760.
 27. Hänscheid T. The future looks bright: low-cost fluorescent microscopes for detection of Mycobacterium tuberculosis and Coccidia. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 2008;102(6):520-521.

Conflicts of Interest: Nil Source of Funding: Nil

Citation: Rekha Bhandari, Gaur DS, Kotwal A, Kusum A. Comparison Of Ziehl – Neelsen (ZN) Staining And Fluorescent (Fl) Staining In Suspected Cases Of Tuberculosis. *National Journal of Medical and Allied Sciences* 2020; 9(1): 15-20

Date of Submission: 22-04-2020

Date of Acceptance: 08-07-2020



KNOWLEDGE AND PRACTICE OF PERSONAL HYGIENE AMONG ADOLESCENTS OF NORTH INDIA

Faizur Rahman¹, Nayyar Azam²

Associate Professor¹, Senior Resident², Department of Pediatrics, Government Medical College and Super Facility Hospital, Chakrapan, Azamgarh, UP, India

ABSTRACT

Introduction: Personal hygiene deficiency has been found to be a thoughtful public health problem especially among school children. This has been attributed to inadequate knowledge of personal hygiene and its practices. This study was designed to explore the existing knowledge and practices of personal hygiene among adolescents of North India.

Material and Methods: This one year cross-sectional study explored personal hygiene knowledge and practices of adolescents in a North Indian District. Pre-tested, self-administered questionnaire was used. Data was collected and analyzed descriptively using Microsoft Excel.

Results: Majority of the adolescents practiced wearing clean clothes (57.4 %) followed by teeth cleaning (47.2%) and proper hair combing (45.9 %). Nearly 67.8% adolescents did not take bath regularly. Most of the adolescents used latrine (64.4%) for defecation. Overall 81.2% adolescents were having knowledge about health related issues. A higher proportion of adolescents had knowledge of food and water protection (37.1%) followed by faecal disposal (29.1%), use of handkerchief (26.1%), hand washing before meals (25.3%) and nail trimming (16.2%). A higher proportion of male adolescents (83.2%) had knowledge of the hygiene as compared to females (78.8%).

Conclusion: Personal hygiene knowledge and practices are not satisfactory among adolescents interviewed in this study. Integrated approach by parents, school and social media to enhance hygiene practices and their knowledge is the need of the hour.

Keywords: Adolescents, knowledge, personal hygiene

Author for correspondence: Dr. Faizur Rahman Email: frrahman47@gmail.com

INTRODUCTION

Personal hygiene is the science of healthy livings and embraces all those day to day activities that contribute to health and wellbeing of an individual.¹ School children are particularly vulnerable to neglect of basic personal hygiene due lack of knowledge and practice.² Poor knowledge, practice of and attitudes to personal hygiene such as hand washing play major roles in the high incidence of communicable diseases and therefore has negative consequences for a child's long term overall development.³ Improved awareness and hand hygiene practices especially among children have effectively reduced gastrointestinal and respiratory tract infections by up to 50% the two leading causes

of childhood morbidity and mortality around the world.⁴⁻⁶ In addition, studies have also shown that school children with better knowledge and practices of personal hygiene have fewer sick days and absenteeism in school and achieve higher grades.^{2,7} School is the place where health education regarding important aspects of hygiene, environment and sanitation, as well as social customs is being imparted.⁸ Health is a key factor in school entry, as well as continued participation and attainment in school. The teacher is the guardian of the child in school and plays a pivotal role in the whole process of primordial prevention.⁹ Bearing in mind that school children have been consistently implicated in the spread of

communicable diseases and that the school has been recognized as a vital setting for health promotion.¹⁰ The diseases that arise due to deficiency of personal hygiene remain one of the major public health concern, particularly in developing countries.¹¹⁻¹⁴ While everybody is susceptible, younger children are predominantly more prone than older counterparts.^{15,16} School children with better knowledge and practices of personal hygiene have fewer sick days and absenteeism in school and achieve higher grades.¹⁷ It is important to find the factors influencing the personal hygiene behaviors in adolescents and barriers in acquisition of proper knowledge and practices related to personal hygiene. The aim of this study was to investigate existing knowledge and practices related to personal hygiene among adolescents in District Kanpur.

MATERIALS AND METHODS

The present cross-sectional study was conducted in the Department of Paediatrics, GSVM Medical College, Kanpur in collaboration with Department of Pediatrics, Government Medical College Azamgarh, UP, India. A total of 954 adolescents were interviewed. Information was collected using a pre-designed and pre tested pro forma which was also had few open ended questions. Protection of individual identity and confidentiality was secured. Parents and primary care providers were also included wherever necessary. After having established a proper rapport with the adolescents who agreed to participate study detailed information regarding knowledge and practices of personal hygiene was obtained.

The adolescents in the age group of 10-18 years studying in various schools, institutions and residing in different urban and rural areas of Kanpur were included. For this, meeting was arranged with principals of schools and colleges and after explaining the purpose of visit, a verbal consent was obtained from them. In home visit consent was obtained from the parent(s) or guardian(s) for the interview and physical examinations. An attempt was also made to include adolescent girls who were examined in the presence of a female attendant. The respondents were interviewed in small batches not exceeding 40 per day. It required multiple visits to complete each school or college in order to get the required information. Thus, the study sample

depicts a representative community from rural and urban area of Kanpur which constitute different ethnic, religious, socio economic, occupational and educational groups of people.

Health related knowledge and personal hygiene:

The factors considered for health knowledge were food and water protection, fecal disposal, nail cutting and washing hands before meals. The personal hygiene included inquiry about footwear, bathing, tooth brushing, combing, cleanliness of skin, nails, clothes and place of defecation.

Ethical consideration:

The study was approved by the Institutional Research Committee (IRC) & the Institutional Ethics Committee (ERC).

Data entry and statistical analysis:

It was performed using the Microsoft Excel and SPSS windows version 16.0 software.

RESULTS

A total of 1126 adolescents were contacted, 954 (84.7%) were studied and 172 (15.3%) could not be interviewed either due to their absence at the time of survey or they refused to give interview.

Table 1: Distribution of adolescents according to their personal hygiene practices

Personal Hygiene	Male		Female		Total	
	No.	%	No.	%	No.	%
Teeth cleaning						
Regular	209	38.8	241	58.1	450	47.2
Irregular	330	61.2	174	41.9	504	52.8
Bath						
Regular	205	38.0	112	27.0	317	32.2
Irregular	334	62.0	303	73.0	637	67.8
Skin						
Clean	167	31.0	179	43.1	346	36.3
Dirty	372	9.0	236	56.9	608	63.7
Nails						
Cut	191	35.4	117	28.2	308	32.3
Not Cut	214	39.7	298	71.8	512	53.7
Clean	149	27.6	206	49.6	355	37.2
Dirty	231	42.9	232	55.9	463	48.5
Clothes						
Clean	329	61.0	219	52.8	548	57.4
Dirty	210	39.0	196	47.2	405	42.6
Hairs						
Combed	211	39.1	227	54.7	438	45.9
Not Combed	328	60.9	188	45.3	516	54.1
Dandruff	141	26.2	98	23.6	239	25.0
Infestation	31	5.8	51	12.3	82	8.6
Defecation						
Open Field	203	37.7	137	33.0	340	35.6
Latrine	336	62.3	278	67.0	614	64.4

Personal hygiene practices among adolescents were not satisfactory. Majority of the adolescents practiced wearing clean clothes (57.4%) followed by teeth cleaning (47.2%) and proper hair combing (45.9 %). Nearly 67.8% adolescents did not take bath regularly. Most of the adolescents used latrine (64.4%) for defecation. (Table 1)

Table 2: Gender wise Distribution of adolescents according to their Knowledge on Hygiene related questions

Hygiene related knowledge (n=954)	Male		Female		Total	
	No.	%	No.	%	No.	%
Correct answers	448	83.2	327	78.8	775	81.2
Incorrect answers	91	16.8	88	21.2	179	18.8

Table 2 indicates that the food and water protection, faecal disposal, nail trimming, hand washing before meal and use of handkerchief while coughing/sneezing are categories under hygiene knowledge of adolescents. Out of 954 adolescents, 81.2% adolescents were having knowledge about hygiene. A higher proportion of Male adolescents had knowledge of the hygiene issues as compared to females.

Table 3: Distribution of adolescents according to their Hygiene related knowledge

Hygiene related knowledge (n=448)	Male		Female		Total	
	No.	%	No.	%	No.	%
Food and water protection	191	35.2	163	39.3	354	37.1
Faecal disposal	162	30.0	116	27.9	278	29.1
Nail trimming	104	19.3	51	12.3	155	16.2
Hand washing before meals	129	23.9	112	26.9	241	25.3
Use of handkerchief while coughing/sneezing	132	24.5	117	28.2	249	26.1

A higher proportion of adolescents had knowledge of food and water protection (37.1%) followed by faecal disposal (29.1%), use of handkerchief (26.1%), hand washing before meals (25.3%) and nail trimming (16.2%). (Table 3)

DISCUSSION

This study was based on school and home visits among urban & rural areas. Thus, the result of this survey is representative of adolescents of rural and

urban areas belonging to different socioeconomic status. This study revealed 81.2% of adolescents had knowledge on hygiene. This is similar to the study which reports good knowledge level among 52% in Angolela, Ethiopia.¹⁸ Remarkably higher findings in our study could be due to greater integration of personal hygiene component in school curriculum and school health program. In the present study female students found significantly higher average knowledge than the males regarding the knowledge of personal hygiene. This is in agreement to the observations of studies from UAE and India, but in disagreement with the findings from Egypt study.¹⁸⁻²⁰ This discrepancy in knowledge score could be due to variation in family orientation, socio-cultural differences and physiologically higher need for cleanliness among adolescent females. These observations clearly demonstrate that the parents and school teacher do play instrumental role in imparting the knowledge and practices of personal hygiene early in the child's life. They could be a crucial role model because clean parents and teachers tend to transmit their attitude and practices among their children.¹ When it comes to hand hygiene practices, the self-reported frequency of hand washing before meals among adolescents in our study is not enough as compared to other studies. For instance, studies from the Bangladesh¹ Philippine²¹ and Colombia²² indicated that 91%, 75.9% and 46.9% of students, reported washing hands before meals. This can be explained by cultural practices, the types of food and use of hands or utensils while eating food. In India, most of the meals are eaten with hands thus, greater emphasis is on washing hands before meals. We have observed that knowledge and practices of hygiene was well correlated with students wearing clean clothes and presentable appearance. A total of 47.2% adolescents were having habit of regularly brushing of teeth in the present study which is similar to Bangladesh study finding.²³ Hygiene practices are heavily influenced by individual's awareness, knowledge and attitude.² Schools are the right place to initiate this behaviour early in the childhood.

CONCLUSION

Personal hygiene knowledge and practices are not satisfactory among adolescents attending schools as well as those residing in Kanpur. Lot more improvement is required in terms of practices. Integrated approach by parents, school and social media to enhance hygiene practices could be useful.

REFERENCES

1. Ghose JK, Rahman MM, Hassan J, Khan MS, Alam AA. Knowledge and practicing behaviour related to personal hygiene among the secondary school students of Mymensingh SadarUpazilla, Bangladesh. *Microbes and Health*. 2012;1(1):34-7
2. Vivas A, Gelaye B, Aboset N, Kumie A, Berhane Y, Williams MA. Knowledge, Attitudes, and Practices (KAP) of Hygiene among School Children in Angolela, Ethiopia. *J Prev Med Hyg*. 2010; 51(2): 73–79.
3. Sarkar M. Personal hygiene among primary school children living in a slum of Kolkata, India. *Journal of Preventive Medicine and Hygiene*. 2013; 54(3):153-158.
4. Curtis V, Cairncross S. Effect of washing hands with soap on diarrhoea risk in the community: a systematic review. *Lancet Infect Dis*. 2003; 3: 275–281.
5. Rabie T, Curtis V. Evidence that handwashing prevents respiratory tract infection: a systematic review. *Trop Med Int Health*. 2006; 11: 258–267.
6. Luby SP, Agboatwalla M, Feikin DR, Painter J, Billhimer W, Altaf A, Hoekstra RM. Effect of handwashing on child health: a randomised controlled trial. *Lancet*. 2005; 366 (9481): 225-33.
7. Water and Sanitation Program Can hygiene be cool and fun: Insights from School Children in Senegal. Available at: <http://www.cominit.com/en/node/264152/38>. [Accessed June 14, 2016].
8. Dongre AR, Deshmukh PR, Boratne AV, Thaware P, Garg BS. An approach to hygiene education among rural Indian school going children. *Online J Health Allied Sci*. 2007; 6: 2.
9. Deb S, Dutta S, Dasgupta A, Misra R. Relationship of Personal Hygiene with Nutrition and Morbidity Profile: A Study among Primary School Children in South Kolkata. *Indian Journal of Community Medicine*. 2010; 35(2): 280-284.
10. Varu R B. School Health Services in India. The social and economic context. Sage Publications Pvt. Ltd; 2008.
11. Paliwal V, Paliwal CK, Fatma N, Chaturvedi S. Personal hygiene habits among school-going children in rural areas of Jaipur, Rajasthan, India. *International Journal of Scientific Research and Reviews*. 2014;3(2):126-42.
12. Tambekar DH, Shirsat SD. Minimization of illness absenteeism in primary school students using low-cost hygiene interventions. *Online J Health Allied Sci*. 2012;11(2):7.
13. AlBashtawy M, Hasna F. Pediculosis capitis among primary-school children in Mafraq Governorate, Jordan. *East Mediterr Health J*. 2012;18(1);43-8.
14. Feachem RG. Interventions for the control of diarrheal diseases among young children: promotion of personal and domestic hygiene. *Bull World Health Organ*. 1984;62(3):467-76.
15. Ahmadu BU, Rimamchika M, Ibrahim A, Nnanubumom AA, Godiya A, Emmanuel P. State of personal hygiene among primary school children: a community based cohort study. *Sudan J Paediatr*. 2013;13(1):38-42.
16. Assefa M, Kumie A. Assessment of factors influencing hygiene behaviour among school children in Mereb-Leke District, Northern Ethiopia: a cross-sectional study. *BMC Public Health*. 2014;14:1000.
17. Ghanim M, Dash N, Abdullah B, Issa H, Albarazi R, Al Saheli Z. Knowledge and practice of personal hygiene among primary school students in Sharjah-UAE. *Journal of Health Science*. 2016;6(5);67-73.
18. Sarkar M. Personal hygiene among primary school children living in a slum of Kolkata, India. *J Prev Med Hyg*. 2013;54(3):153-8.
19. Ghanim M, Dash N, Abdullah B, Issa H, Albarazi R, Al Saheli Z. Knowledge and practice of personal hygiene among primary school students in Sharjah-UAE. *Journal of Health Science*. 2016;6(5);67-73.
20. Elsabagh HM, Atlam SA, Shehab NS. Knowledge, attitude and practice regarding personal hygiene among preschool children in Tanta city, Gharbia Governorate, Egypt. *Int J Med Res Prof*. 2016;2(2);255-61.

21. Lopez-Quintero C, Freeman P, Neumark Y. Hand washing among school children in Bogotá, Colombia. *Am J Public Health*. 2009;9(1):94-101. DOI: 10.2105/AJPH.2007.129759
22. Department of Health, Republic of the Philippines. Knowledge, attitudes, and practices of school children on environmental health and sanitation. Environmental Health Service in collaboration with Department of Education, Culture and Sports and assistance from UNICEF. Manila: Department of Health; 1996.
23. Al-Ansari JM, Honkala S. Gender differences in oral health knowledge and behavior of the health science college students in Kuwait. *Journal of Allied Health*. 2007;36(1):41-6.

Conflicts of Interest: Nil Source of Funding: Nil

Citation: Rahman F, Azam N. Knowledge And Practice of Personal Hygiene Among Adolescents of North India. National Journal of Medical and Allied Sciences 2020; 9(1): 21-25

Date of Submission: 30-04-2020

Date of Acceptance: 31-05-2020



DETERMINANTS OF HEALTH STATUS OF CURRENT NEONATES IN LUCKNOW CITY OF UTTAR PRADESH

Saurabh Kashyap¹, Jamaal Masood², Reema Kumari³

¹ Associate Professor, Department of Community Medicine, Integral Institute of Medical Sciences and Research, Integral University, Lucknow ^{2,3} Professor & Head, Department Of Community Medicine & Public Health, King George's Medical University, Lucknow

ABSTRACT

Background: Janani Suraksha Yojana has been implemented in India to reduce maternal, neo-natal mortality and promote institutional delivery among the poor pregnant women of rural and urban areas. This study was undertaken to assess the determinants of neonatal weight and length in Lucknow City and to assess the factors associated with the Janani Suraksha Yojana (JSY) services availed and the knowledge about family planning methods in Lucknow City.

Material and Methods: The present study has been conducted from the period between August 2011 to July 2012 at labor wards of Primary health center of Sarojini Nagar block, Community health center of Itaunja block and Bakshi ka talab block of Lucknow district. The sample size has been taken is 400. Interviewing of all the recently delivered women under JSY at selected CHC/PHC and clinical examination including anthropometric measurements of their neonate have been primary methods for collection of data.

Results: Majority (71%) of the children weighed above 2.5kg and 29% of the neonates were having low birth weight (<2.5kg). Majority of the neonates received BCG vaccination (91.3%), OPV (92.5%) and Hep B (83.5%). Only education of mother as middle school & above (p=0.03) were found to be significant factors.

Conclusion: In this small-scale study, it is evident that JSY is positively associated with immunization coverage in Lucknow city. The importance of socioeconomic conditions on neonate's health status suggests that effort to improve nutritional status of mothers before and during pregnancy should be encouraged.

Keywords: Neonates; immunizations; mother's education; family planning

Author for correspondence: Dr. Saurabh Kashyap Email: dr.saurabh2000@gmail.com

INTRODUCTION

In India, the Janani Suraksha Yojana has been implemented is to reduce maternal, neo-natal mortality and promote institutional delivery among the poor pregnant women of rural and urban areas. This scheme is hundred percent centrally sponsored and integrated cash monetary help to pregnant women. Accredited Social Health Activist (ASHA) is a trained activist of same village and works as link person among the health institutions, pregnant women and masses to increase institutional deliveries. Uttar Pradesh is one of the states classified as Low Performing States (LPS) as well

as Empowered Action Group (EAG) state in context to demographic and health status point of views. Previous study has observed that deaths that occur among babies less than 28 days of life (neonatal period) account for about 40% of all under-five deaths.¹ Apart from 3.1 million newborn deaths that took place in 2010 an additional 2.6 million babies were estimated to be stillborn.² A meta-analysis in India showed that child nutrition outcomes indicate that a longer birth interval is associated with a lower risk of malnutrition.³ Other study has found that newborn mortality is one of the world's most neglected health problems and estimated that

globally four million newborn die before they reach one month of age and another four million are stillborn every year.⁴ Researcher has hypothesized that fetal undernutrition leads to various adult chronic diseases.⁵ In developing countries, one-sixth of babies have a low birth weight (<2500 g).^{6,7} Weight and length of newborn infants are influenced to a certain extent by maternal nutritional status both before and during pregnancy⁸, while the effect of socioeconomic condition on birth weight is mediated through effects on the mother.^{9,10} Low weight gain particularly during second trimester elevates the risk of intrauterine growth retardation.¹¹⁻¹³ In the Gambia, energy and protein supplementation resulted in an increased birth weight only when provided to pregnant women during a season of hunger and intense agriculture work.¹⁴ Provision of additional energy during the last trimester to mothers in Madura in East Java did not improve the birth weight of their infants.¹⁵ In addition to the intake of energy and nutrients, socioeconomic factors are associated with nutritional status during pregnancy and determine, in part, neonatal weight and length. With this background the present study was undertaken to assess the determinants of neonatal weight and length in Lucknow City and to assess the factors associated with the Janani Suraksha Yojana (JSY) services availed and the knowledge about family planning method in Lucknow City.

MATERIAL AND METHODS

Study universe: The present study included the 3 blocks, viz: Sarojini Nagar, Itaunja and Bakshi ka talab of Lucknow district. Rural Health Training Centre is also located near Sarojininagar PHC/CHC, on Lucknow-Kanpur highway, 20 Kms. from the university. This is the field practice area of the Department of community medicine and public health, KGMU. The study was conducted at the labour wards of Primary health centre of Sarojni Nagar block, Community health centre of Itaunja block and Bakshi ka talab block.

Study population: All pregnant women delivering recently at the PHC/CHC under JSY along with their neonates.

Study unit: Recently delivered women and their neonates.

Sample size: 400

Total period of study: One year from August 2011 to July 2012.

Study design: Cross sectional study has been performed.

Inclusion criteria: All pregnant mothers recently delivering at PHC/CHC under JSY, having one previous live birth.

Anthropometric Measurements:

- 1) **Weight:** Weight of the newborn was measured weighing machine/infantometer.
- 2) **Length:** At first the head of the neonate was positioned supine. The body and legs were kept straight. Then by inch tape the length of the neonate was measured in centimeters.
- 3) **Head circumference:**
 - a) The measurement has been taken with a device that cannot be stretched, such as a flexible metal tape measure.
 - b) The tape was wrapped snugly around the widest possible circumference from the most prominent part of the forehead (often 1-2 fingers above the eyebrow) to the widest part of the back of the head.
- 4) **Chest circumference:** Chest circumference was obtained by measuring around the infant's chest at the nipple line.

Methodology: Interviewing of all the recently delivered women under JSY at selected CHC/PHC and clinical examination including anthropometric measurements of their neonate have been primary methods for collection of data.

Interviewing technique: All information of the JSY beneficiaries regarding their name, age, religion, caste, family composition, occupation, obstetrical history, breast feeding practices, knowledge about birth interval along with the contraceptive practices and immunization status of neonate were obtained. Socioeconomic status was calculated according to modified Udai Parekh Scale, 2003.

Clinical Examination: Clinical examination along with the anthropometric measurements of current neonate was done as per interview schedule.

Statistical analysis: Data were analyzed using the statistical software SPSS 17 for windows. Multivariate logistics regression analysis has been used to find out the association factors.

RESULTS

About one third (35.5%) of the beneficiaries were in the age group of 25-30 years followed by 31-35yrs (26.8%), 36-40 (19%) and 18-24 (18.8%) years.

Table 1: Background characteristics of JSY beneficiaries

Characteristics	Beneficiaries		Husband	
	No.	%	No.	%
Education				
Illiterate	113	28.3	108	27.0
Just literate	104	26.0	99	24.8
Primary school	51	12.8	46	11.5
Middle & above	132	33.0	147	36.8
Occupation				
Unemployed	132	33.0	122	30.5
Farm worker	86	21.5	93	23.3
Unskilled worker	99	24.8	102	25.5
Others	83	20.8	83	20.8
Socio economic status				
III	85 (21.3%)			
IV	90 (22.5%)			
V	225 (56.3%)			

Majority of beneficiaries (33%) along with their husbands (36.8%) were educated upto middle & above school. Nearly one third of the beneficiaries and their husbands were unemployed. More than half of the beneficiaries belonged to SES V (Table-1).

Table 2: Relation between birth order of current neonates with their mean head/chest circumference

Recently Delivered Child	Sample (n=400)	Mean head circumference / mean chest circumference	ANOVA p-value
Birth order of current child			
2	180	1.06±0.15	0.06
3	121	1.05±0.10	
4 and above	99	1.02±0.07	
Birth interval			
<1	39	1.06±0.09	0.46
1-2	110	1.06±0.18	
2-3	77	1.04±0.05	
3 and above	174	1.04±0.09	

There was no significant difference in the ratio of head and chest circumference of neonate among different birth order and interval. (Table 2)

Table 3: Relation between birth order of current neonates with their mean length

Recently Delivered Child	Sample (n=400)	Mean Length	ANOVA p-value
Birth order of current child			
2	180	46.33±3.20	0.01
3	121	46.10±2.67	
4 and above	99	47.21±2.60	
Birth interval			
<1	39	46.00±3.51	0.66
1-2	110	46.48±2.89	
2-3	77	46.38±3.22	
3 and above	174	46.63±2.68	

There was no significant difference in the length of neonate among different birth order and interval. (Table 3)

Table 4: Relation between birth order of current child with their mean weight

Recently Delivered Child	Sample=400	Mean Weight	ANOVA p-value
Birth order of current child			
2	180	2576.11±550.68	<0.0001
3	121	2621.49±541.02	
4 and above	99	2846.46±331.14	
Birth interval			
<1	39	2435.90±432.14	<0.0001
1-2	110	2467.91±498.67	
2-3	77	2503.25±346.45	
3 and above	174	2954.89±321.34	

The birth weight was significantly (p<0.0001) higher among the neonate of birth order 4 & above (2846.46±331.14) as compared to 3 (2621.49±541.02) and 2 (2846.46±331.14). The birth interval was significantly (p<0.0001) higher among the neonate of birth interval 3 and above (2954.89±321.34) as compared to 2-3(2503.25±346.45), 1-2 (2467.91±498.67) and <1(2435.90±432.14). (Table 4)

Table 5: Multivariate logistic regression results showing the factors associated with the JSY utilization

Factors	Beta coefficient	S.E.	OR	95.0% C.I. for OR		p-value
				Lower	Upper	
Education of mother						
Illiterate			1.00 (Ref)			
Just literate	-0.97	0.47	0.38	0.15	0.95	0.04*
Primary school	0.19	0.74	1.21	0.28	5.14	0.80
Middle & above	0.59	0.53	1.80	0.64	5.06	0.27
Occupation of mother						
Unemployed			1.00 (Ref)			
Farm worker	0.58	0.90	1.78	0.30	10.42	0.52
Unskilled	-1.91	0.87	0.15	0.03	0.82	0.03*
Others	0.19	0.80	1.21	0.25	5.79	0.81
Education of father						
Illiterate			1.00 (Ref)			
Just literate	-0.71	0.43	0.49	0.21	1.15	0.10
Primary school	0.32	0.75	1.38	0.32	6.02	0.67
Middle & above	1.13	0.48	3.10	1.22	7.87	0.02*
Occupation of father						
Unemployed			1.00 (Ref)			
Farm worker	-0.81	0.92	0.45	0.07	2.70	0.38
Unskilled	0.57	0.97	1.77	0.27	11.84	0.56
Others	-0.61	0.82	0.54	0.11	2.70	0.46

p value<0.05 SE-Standard Error, OR-Odds Ratio, CI-Confidence Interval, Ref-Reference

The unskilled worker ($p=0.03$) and education of father as middle & above ($p=0.02$) were significant factors found in the multivariate analysis. (Table 5)

DISCUSSION

The present cross-sectional study was conducted across 3 blocks of Lucknow district viz., Sarojininagar, Itaunja and Bakshi-ka-talab over a period of 8 months. The study has planned to study the determinants of health status of the current neonate of beneficiaries was also assessed. Interview of mother, clinical examinations and anthropometric measurements were the main tools adopted for the present study.

Deaths that occurs among babies less than 28 days of life (neonatal period) account for about 40% of all under-five deaths.¹⁶ The length, head circumference and chest circumference are almost similar in all the birth order. There is no significant difference in the ratio of head and chest circumference of neonate among different birth order and interval. In the current study, out of total 400 neonates weighed, 116 (29%) were less than 2500grams and the remaining 284 (71%) were above 2500 grams. A cross sectional study found that the mean birth weights were 2976 ± 476 grams.¹⁷

Vaccination has been shown to be one of the most cost-effective health interventions worldwide, through which a number of serious childhood diseases have been successfully prevented or eradicated. In the study majority of the neonates received BCG vaccination (91.3%), OPV (92.5%) and Hep B (83.5%). Researchers have found that 36% of children aged 12-23 months were fully vaccinated by card plus recall, but only 27.7% were fully vaccinated by card alone and 23.7% children were unvaccinated.¹⁸ Another study has found that vaccination coverage at 1 year of age was high for all National immunization schedule vaccines.¹⁹ Study observed that about 62.2% of the children were fully immunized.²⁰ Researchers have also found that the coverage of TT immunization was significantly associated with proximity to outreach clinics and the presence of a health worker in the community.²¹ Another study has showed that the overall coverage for mandatory vaccines (OPV, DT and HBV) exceeded 94%, but only 79% had been vaccinated in accord with the recommended schedule.²² Researchers have revealed that approximately 54 % of children has been covered for immunization in West Bengal.²³

Conclusion

In this small-scale study, it evident that JSY is positively associated with immunization coverage in Lucknow city. The importance of socioeconomic conditions on

neonate's health status suggests that effort to improve nutritional status of mothers before and during pregnancy should be encouraged. Although iron and vitamin A supplementation during pregnancy did not affect neonatal weight and length, it may influence subsequent nutritional status and growth, as well as mental and motor development.

REFERENCES

1. Cousens S, Blencowe H, Stanton C, Chou D, Ahmed S, Steinhardt L, Creanga AA, Tunçalp Ö, Balsara ZP, Gupta S, Say L. National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995: a systematic analysis. *The Lancet*. 2011 Apr 16;377(9774):1319-30.
2. World Health Organization. National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995. Geneva: World Health Organization; 2011.
3. Dwivedi SN, Sundaram KR. Epidemiological models and related simulation results for understanding of contraceptive adoption in India. *International journal of epidemiology*. 2000 Apr 1;29(2):300-7.
4. Parlato RP, Darmstadt GL, Tinker A. Saving newborn lives, Initiative. Washington, DC. 2005.
5. Barker DJ. Mothers, babies, and disease in later life. London: BMJ Publishing Group; 1994.
6. Blössner M, Villar J. Levels and patterns of intrauterine growth retardation in developing countries. *European journal of clinical nutrition*. 1998 Jan;52: S5-15.
7. Villar J, Gülmezoglu ME. Nutritional interventions to prevent intrauterine growth retardation: evidence from randomized controlled trials. *European Journal of Clinical Nutrition*. 1998 Jan;52: S83-93.
8. Kramer MS. Determinants of low birth weight: methodological assessment and meta-analysis. *Bulletin of the world health organization*. 1987;65(5):663.
9. Kramer MS. Socioeconomic determinants of intrauterine growth retardation. *European Journal of Clinical Nutrition*. 1998 Jan;52: S29-32.
10. Tuntiseranee P, Olsen J, Chongsuvivatwong V, Limbutara S. Socioeconomic and work-related determinants of pregnancy outcome in southern Thailand. *Journal of Epidemiology & Community Health*. 1999 Oct 1;53(10):624-9.

11. Abrams B, Selvin S. Maternal weight gain pattern and birth weight. *Obstetrics & Gynecology*. 1995 Aug 1;86(2):163-9.
12. Strauss RS, Dietz WH. Low maternal weight gain in the second or third trimester increases the risk for intrauterine growth retardation. *The journal of nutrition*. 1999 May 1;129(5):988-93.
13. Abrams B, Altman SL, Pickett KE. Pregnancy weight gain: still controversial. *The American journal of clinical nutrition*. 2000 May 1;71(5):1233S-41S.
14. Prentice AM, Cole TJ, Foord FA, Lamb WH, Whitehead RG. Increased birthweight after prenatal dietary supplementation of rural African women. *The American journal of clinical nutrition*. 1987 Dec 1;46(6):912-25.
15. Kardjati SR, KUSIN JA, De With C. Energy supplementation in the last trimester of pregnancy in East Java: I. Effect on birthweight. *BJOG: An International Journal of Obstetrics & Gynaecology*. 1988 Aug;95(8):783-94.
16. UNICEF W. Levels and trends in child mortality: report 2011. Estimates developed by the UN Inter-agency Group for child mortality estimation. New York: United Nation's Children Fund. 2011.
17. Zeleke BM, Zelalem M, Mohammed N. Incidence and correlates of low birth weight at a referral hospital in Northwest Ethiopia. *Pan African Medical Journal*. 2012;12(1).
18. Etana B, Deressa W. Factors associated with complete immunization coverage in children aged 12–23 months in Ambo Woreda, Central Ethiopia. *BMC public health*. 2012 Dec;12(1):566.
19. Yadav K, Srivastava R, Kumar R, Chinnakal P, Rai SK, Krishnan A. Significant vaccination delay can occur even in a community with very high vaccination coverage: evidence from Ballabgarh, India. *Journal of tropical pediatrics*. 2011 Jul 8;58(2):133-8.
20. Phukan RK, Barman MP, Mahanta J. Factors associated with immunization coverage of children in Assam, India: over the first year of life. *Journal of Tropical Pediatrics*. 2008 May 1;55(4):249-52.
21. Jamil K, Bhuiya A, Streatfield K, Chakrabarty N. The immunization programme in Bangladesh: impressive gains in coverage, but gaps remain. *Health policy and planning*. 1999 Jan 1;14(1):49-58.
22. Salmaso S, Rota MC, DegliAtti MC, Tozzi AE, Kreidl P. Infant immunization coverage in Italy: estimates by simultaneous EPI cluster surveys of regions. ICONA Study Group. *Bulletin of the World Health Organization*. 1999;77(10):843.
23. Som S, Pal M, Chakrabarty S, Bharati P. Socioeconomic impact on child immunisation in the districts of West Bengal, India. *Singapore medical journal*. 2010 May 1;51(5):406.

Conflicts of Interest: Nil Source of Funding: Nil

Citation: Kashyap S, Masood J, Kumari R. Determinants of Health Status Of Current Neonates in Lucknow City Of Uttar Pradesh. National Journal of Medical and Allied Sciences 2020; 9(1): 25-29

Date of Submission: 06-05-2020

Date of Acceptance: 26-05-2020



EVALUATION OF CLINICAL PROFILE AND FUNCTIONAL OUTCOME FOLLOWING SURGICAL INTERVENTION IN THIRD VENTRICULAR COLLOID CYST: AN INSTITUTIONAL EXPERIENCE

Ranjit Kumar¹, Yashbir Dewan², Brijesh Kumar Tiwari³, Sanjeev Kumar Pandey⁴

¹Associate Professor, ² Professor, ^{3,4} Assistant Professor, Departments of Neurosurgery, Himalayan Institute of Medical Sciences Jolly Grant, Dehradun, UK

ABSTRACT

Introduction: Colloid cysts are the cystic lesions located near the foramen of Monroe. Clinical profile ranges from an asymptomatic lesion detected incidentally to rapidly worsening hydrocephalus resulting in death. For symptomatic patients, surgical excision of the cyst along with the wall by endoscopic or microscopic access is the treatment of choice. We studied the clinical, radiological and surgical profile with outcome of third ventricular colloid cyst patients.

Material and Methods: In this retrospective study, data was collected of patients of radiologically and histologically proven diagnosis of third ventricular colloid cyst managed in our department between 2009 and 2018. Patients had either preoperative CT or MRI brain done, were operated and their clinical profiles with surgical outcome were studied.

Results: A total of 8 patients were operated in these years. All patients presented with history of headache with signs of raised intracranial pressure. Half of the patients had history of loss of consciousness at some point of time. Four of the patients (50%) had a contrast CT done preoperatively and rest of the patients had MRI brain with contrast. All the patients had hydrocephalus. Cyst diameter ranged from 6 mm to 25 mm with an average size of 1.4 cc. 25% patients required preoperative external ventricular drain placement. 50% of the patients were dealt with endoscopic excision and 50% with open surgical excision. Amongst patients operated with open surgical approach, all cysts were accessed through right frontal transcortical approach. One patient continued to have symptomatic hydrocephalus and required a VP shunt placement. None of the patients developed postoperative infection, chemical or bacterial meningitis.

Conclusions: Colloid cyst of the third ventricles may undergo increase or decrease in size and the symptomatic patients are treated surgically. In developing countries like India, where the patients are likely to miss the frequent follow up, the symptomatic patients should be treated operatively. Successful surgeries without damaging the fornix are associated with good surgical outcome. Larger database including the subgroup of the patients opting for conservative management would be required for further analysis.

Keywords: Colloid cyst; third ventricle; diagnosis; surgical; endoscopy; radiology

Correspondence: Brijesh Kumar Tiwari Email: brijamc@gmail.com

INTRODUCTION

Colloid cysts are benign tumors with a probable origin from neuro-ectodermal layer.^{1, 2} As these cysts are located close to foramen of Monroe, it may cause blockage of the CSF pathway and sudden death.³ Surgical resection is the treatment of choice for symptomatic colloid cysts, whereas several clinicians prefer to manage small

asymptomatic cysts by serial observation with repeated magnetic resonance imaging (MRI).^{4, 5} If getting operated, radical removal of the cyst wall is necessary to prevent the recurrence.⁶ The aim of this study was to look at the clinical profile and surgical outcome of these patients in a tertiary care health setup.

MATERIALS AND METHODS

The study was conducted at Neurosurgery department of Himalayan Hospital, Jolly Grant, Dehradun. All the necessary clearances were obtained from the institutional research review committee and ethical committee.

Patients

In this retrospective study, patients diagnosed with a third ventricular cystic mass in the region of the foramen of Monroe on the basis of CT, MRI and surgical findings and histopathology (Image 4), who were managed in our department from January 2009 to December 2018 were studied.

Tumors arising from the lateral ventricle or periventricular structures were excluded. Masses arising in the fourth ventricle were also excluded. Only isolated cystic neoplasms were included in the study and ill-defined masses involving the multiple ventricles like choroid plexus papilloma were also excluded.

Clinical features:

Patients were assessed in terms of presence of headache and signs of raised intracranial pressure, like vomiting, blurring of vision, impaired sensorium and papilledema at the time of admission.

Imaging

All the images were accessed through the departmental local database for the images. Preoperative CT and MR imaging with or without contrast was done for the patients. Brain images were evaluated in terms of hydrocephalus, size of the cyst, enhancement pattern after contrast administration and associated periventricular edema (Image 1, 2 and 3).

Surgery

All patients who underwent definitive surgery (open or endoscopic) were included in the study. Surgical parameters assessed were time of surgery, blood loss, associated CSF diversion surgery and need of ventilation postoperatively.

Statistical methods

Data were entered in Excel software (Microsoft, Seattle, WA) and were analyzed using SPSS software, version 11.5 (SPSS, Inc. Chicago, IL).

RESULTS

There were 8 patients (6 males and 2 females; mean age, 35.4 years SD +/- 5.6 years; range, 13 years to 59 years).

Clinical features

The clinical features of the cysts are summarized in Table 1. All our patients presented with history of headache and 7 out of 8 patients (87.5%) had history of vomiting. 50% of the patients presented to emergency department with altered sensorium. Out of that one patient had a GCS score of 7, who had history of headache and vomiting before drop in sensorium. Only one patient (12.5%) had lateral rectus paresis. 4 patients (50%) had visual symptoms in the form of visual obscurations or decreased vision. 4 patients (50%) had papilledema at the time of admission. None of the patients had seizures or focal motor deficit. One patient had coexisting right thalamic small bleed. None of the patients had any form of CSF diversion procedure performed elsewhere. 2 patients (25%) required emergency external ventricular drainage, before the definitive surgery. All 8 patients had significant improvement in headache and vomiting. Out of the two patients, who had visual symptoms, one showed no improvement following surgery.

Radiological features

The radiological features of the cysts are summarized in Table 2. 4 of our patients (50%) had a contrast CT done preoperatively and rest of the patients had MRI brain with contrast. All the patients had hydrocephalus. All images showed a well-defined cystic (firm in 2 cases) mass at the foramen of Monroe, causing obstruction of the lateral ventricular outlet (Image 1 and 2). 3 patients (37.5%) had enhancing cyst wall. Cyst diameter ranged from 6 mm to 25 mm with an average size of 1.4 cc. In four patients, the cyst wall showed mild enhancement. Rest of the four patients had no enhancement of the cyst wall or contents. One patient had a right thalamic spontaneous bleed as an incidental finding, which seemed to be unrelated to the colloid cyst.

Surgical features

The surgical approaches and need of preoperative or postoperative CSF diversion surgeries have been discussed in Table 3. 2 of our patients (25%) required preoperative external ventricular drain

placement due to unavoidable delay in surgery or sudden drop in GCS score in EMR. 50% of the patients were dealt with endoscopic excision and 50% with open surgical excision. Amongst patients operated with open surgical approach, all cysts were accessed through right frontal transcortical approach. Two patients developed postoperative pneumocephalus, which was managed conservatively (Image 3). One patient continued to have symptomatic hydrocephalus and required a VP shunt placement. None of the patients developed postoperative infection, chemical or bacterial meningitis.

Table 1: Clinical profile of the patients

Pt. No.	Age/ Sex	Imaging available	Size of cyst	Hydrocephalus	Cyst wall enhancement
1	40/F	MRI	18 x 20 x 12 mm	Moderate	Enhancing
2	55/M	CT	15 x 12 mm	Moderate	Non enhancing
3	59/M	CT	8 x 6 mm	Moderate	Non enhancing
4	13/M	MRI	9 x 12 x 15 mm	Severe	Enhancing
5	45/M	CT	10 x 15 mm	Moderate	Non enhancing
6	22/M	MRI	14 x 12 x 10 mm	Moderate	Non enhancing
7	25/F	MRI	25 x 20 x 15 mm	Severe	Enhancing
8	24/M	CT	18 x 12 mm	Severe	Non enhancing

Table 2: Radiological properties of the cyst

Patient	Age/ Sex	Headache	Vomiting	Loss of consciousness	Preop GCS score	Lateral rectus paresis
1	40/F	Yes	Yes	Yes	14, E4V4M6	No
2	55/M	Yes	Yes	Yes	7, E1V1M5	No
3	59/M	Yes	Yes	Yes	14, E4V4M6	No
4	13/M	Yes	Yes	No	14, E4V4M6	No
5	45/M	Yes	Yes	No	15, E4V5M6	No
6	22/M	Yes	Yes	No	15, E4V5M6	No
7	25/F	Yes	Yes	Yes	15, E4V5M6	Yes
8	24/M	Yes	No	No	15, E4V5M6	No

Table 3: Surgical aspects of the cyst

Patient number	Age/ Sex	Pre-op CSF diversion	Mode of surgery	Approach	Post op CSF diversion	Outcome
1	40/F	Nil	Endoscopic	Left frontal	Nil	Excellent
2	55/M	Nil	Endoscopic	Right frontal	Nil	Good
3	59/M	Nil	Open	Right frontal	Nil	Good
4	13/M	Nil	Open	Left frontal	Nil	Average
5	45/M	Nil	Endoscopic	Right frontal	Nil	Average
6	22/M	Nil	Open	Right frontal	Nil	Excellent
7	25/F	EVD	Open	Right frontal	Right VP shunt	Average
8	24/M	EVD	Endoscopic	Right frontal	Nil	Good

DISCUSSION

Colloid cysts are benign intraventricular cysts which constitute about 15-20% of all ventricular tumors.^{1,3} These are usually found in healthy adults, who are commonly asymptomatic except for the subgroup of patients who may present with sudden

loss of consciousness or headache due to blockage of foramen of Monroe and resultant raised intracranial pressure. The diagnosis of colloid cyst can be made only radiologically. MRI brain with contrast is the gold standard but CT brain is a fairly sensitive imaging modality with significantly lower cost. Cysts have different appearance on imaging depending on the composition of the fluid within. If the cholesterol and protein content are high, it looks hyperdense on plain CT, hyperintense on T1 and hypointense on T2 weighted magnetic resonance imaging.^{7, 8} The risk involved in the surgery is mainly related to the proximity of the colloid cyst to the fornix, which may get damaged.⁹ As the clear surgical indications for the cyst remains ill-defined, the risk of operating on such patients due to sudden deterioration should be weighed against the advantages of operating. Barring a rare group of patients experiencing hemorrhage into the cyst commonly called as the 'Cyst Apoplexy',^{10, 11} most of the patients have worsening headache and signs of raised intracranial pressure before acute deterioration.^{11, 12} Risk factors associated with the deterioration for such patients include cyst diameter and volume, T2W and FLAIR hyper-intensities around the cyst, pre-existing hydrocephalus, younger age.^{4, 6, 13, 14} Beaumont et al¹⁵ mentioned anatomical risk Zone I and III of the third ventricle and colloid cyst risk score of 4 or less as additional criteria for the deterioration. Three types of surgical approaches have been discussed variably in the literature viz microsurgical approach, endoscopic excision and stereotactic aspiration and decompression.^{3, 14, 16, 17} As the microsurgical approach is associated with possible injury to nearby vital structures several authors have advocated use of endoscopy as a better method.¹⁸ One of the largest meta-analysis done by Sheikh et al¹⁹ done over 1278 patients comparing the endoscopic and open microscopic surgery showed that recurrence rate is higher in endoscopic group due to incomplete excision. It further stated that complete resection was significantly higher in open surgery (98%) versus the 58% cases of total resection in endoscopic surgeries. In our series 50% of the patients were treated endoscopically and 50% underwent open resection. None of the patients had any recurrence till last follow up. Postoperative

neurological status did not show any difference in the endoscopic or open surgery subgroup in our series. Extent of resection also remained the same in both the subgroups for our patients. Our complications were limited to transient pneumocephalus and postoperative hydrocephalus in one patient requiring VP shunt, which was comparable to most of the data published before.

CONCLUSION

Colloid cyst of the third ventricles may undergo increase or decrease in size. Symptomatic patients are treated surgically. If operated on time, the operative morbidity and mortality could be avoided. If going for the conservative management, the surgeon should keep the patients under close observation. In developing countries like India, where the patients are likely to miss the frequent follow up, the symptomatic patients should be treated operatively. Successful surgeries without damaging the fornix are associated with good surgical outcome. Larger database including the subgroup of the patients opting for conservative management would be required for further analysis.

Figure legends

Image 1: CT brain with contrast, axial cut showed a well defined cystic mass blocking the foramen of Monroe. The cyst measured approx 1.6 x 1.5 cms in size and showed homogenous hyper-density. The obstructive hydrocephalus was evident due to dilatation of bilateral temporal horns and ballooning of the third ventricle.



Image 2: CT brain with contrast, sagittal cut showed a well defined cystic mass in the floor of the third ventricle. There was dilatation of the suprapineal recess and the fourth ventricle was normal in size.

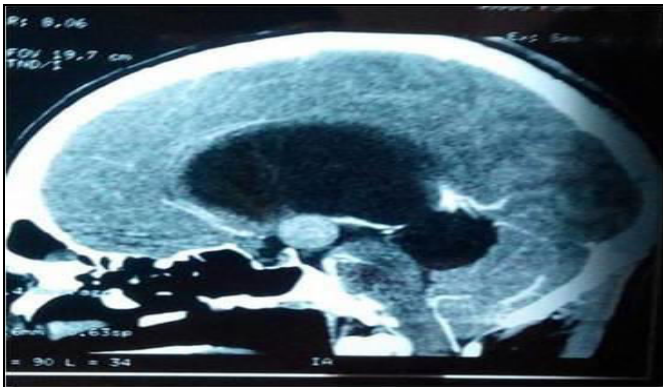


Image 3: Postoperative plain CT brain (Day 1) showed total excision of the cyst. The mass was approached through the right frontal horn. The scan showed resolution of the hydrocephalus. There was some bi-frontal pneumocephalus noted, which resolved over next 4 days.

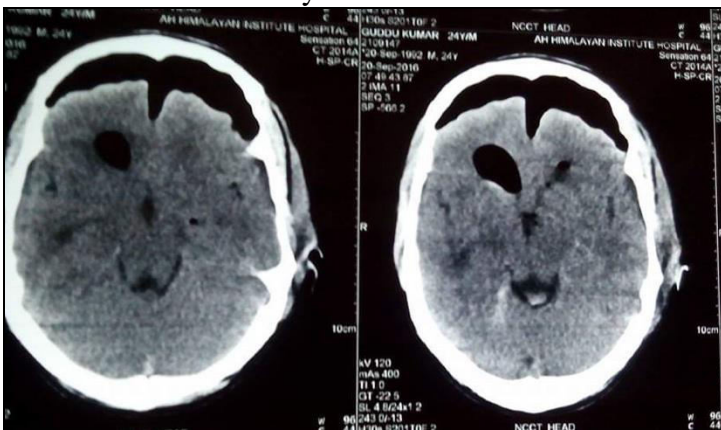
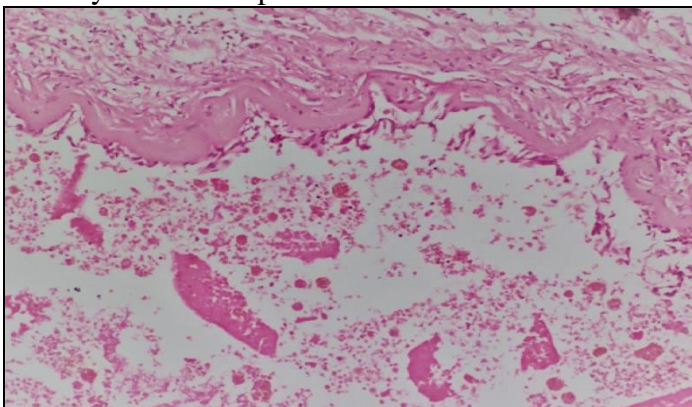


Image 4: 200X magnification histopathological images showed features suggestive of a benign cyst lined by columnar epithelium.



REFERENCES

1. Turillazzi E, Bello S, Neri M, Riezzo I, Fineschi V. Colloid cyst of the third ventricle, hypothalamus, and heart: a

2. Stachura K, Libionka W, Moskała M, Krupa M, Polak J. Colloid cysts of the third ventricle. Endoscopic and open microsurgical management. *Neurologia i neurochirurgia polska*. 2009;43(3):251-7.
3. Silva D, Matis G, Chrysou O, Carvalho Junior EV, Costa L, Kitamura M, Birbilis T, Azevedo Filho H. Sudden death in a patient with a third ventricle colloid cyst. *Arq Neuropsiquiatr*. 2012 Apr 1;70(4):311.
4. Pollock BE, Huston J. Natural history of asymptomatic colloid cysts of the third ventricle. *Journal of neurosurgery*. 1999 Sep 1;91(3):364-9.
5. Wilson DA, Fusco DJ, Wait SD, Nakaji P. Endoscopic resection of colloid cysts: use of a dual-instrument technique and an anterolateral approach. *World neurosurgery*. 2013 Nov 1;80(5):576-83.
6. Mathiesen T, Grane P, Lindgren L, Lindquist C. Third ventricle colloid cysts: a consecutive 12-year series. *Journal of neurosurgery*. 1997 Jan 1;86(1):5-12.
7. Algin O, Ozmen E, Arslan H. Radiologic manifestations of colloid cysts: a pictorial essay. *Canadian Association of Radiologists' Journal*. 2013 Feb;64(1):56-60.
8. El Khoury C, Brugières P, Decq P, Cosson-Stanescu R, Combes C, Ricolfi F, Gaston A. Colloid cysts of the third ventricle: are MR imaging patterns predictive of difficulty with percutaneous treatment?. *American journal of neuroradiology*. 2000 Mar 1;21(3):489-92.
9. Sampath R, Vannemreddy P, Nanda A. Microsurgical excision of colloid cyst with favorable cognitive outcomes and short operative time and hospital stay: Operative techniques and analyses of outcomes with review of previous studies. *Neurosurgery*. 2010 Feb 1;66(2):368-75.
10. Godano U, Ferrai R, Meleddu V, Bellinzona M. Hemorrhagic colloid cyst with sudden coma. *min-Minimally Invasive Neurosurgery*. 2010 Oct;53(05/06):273-4.
11. Jeffree RL, Besser M. Colloid cyst of the third ventricle: a clinical review of 39 cases. *Journal of clinical neuroscience*. 2001 Jul 1;8(4):328-31.
12. Büttner A, Winkler PA, Eisenmenger W, Weis S. Colloid cysts of the third ventricle with fatal outcome: a report of two cases and

- review of the literature. International journal of legal medicine. 1997 Aug 1;110(5):260-6.
13. Camacho A, Abernathey CD, Kelly PJ, Laws ER. Colloid cysts: experience with the management of 84 cases since the introduction of computed tomography. Neurosurgery. 1989 May 1;24(5):693-700.
 14. Desai KI, Nadkarni TD, Muzumdar DP, Goel AH. Surgical management of colloid cyst of the third ventricle—a study of 105 cases. Surgical neurology. 2002 May 1;57(5):295-302.
 15. Valença MM, de Farias HS, Almeida LC, dos Santos França CL, Nobre KE, Valença MA, Júnior ML, de Andrade Valença LP, Valença MM, Farias HS, Almeida LC. Headache as a single clinical manifestation of a colloid cyst in the third ventricle. Headache Medicine. 2017 Jan;8(1):25.
 16. Kapu R, Pande A, Vasudevan M, Ramamurthi R. Giant colloid cyst of third ventricle with microhemorrhages causing neurological deterioration: A very rare presentation. Neurology India. 2012 Sep 1;60(5):557.
 17. Grondin RT, Hader W, MacRae ME, Hamilton MG. Endoscopic versus microsurgical resection of third ventricle colloid cysts. Canadian journal of neurological sciences. 2007 May;34(2):197-207.
 18. Levine NB, Miller MN, Crone KR. Endoscopic resection of colloid cysts: indications, technique, and results during a 13-year period. min-Minimally Invasive Neurosurgery. 2007 Dec;50(06):313-7.
 19. Sheikh AB, Mendelson ZS, Liu JK. Endoscopic versus microsurgical resection of colloid cysts: a systematic review and meta-analysis of 1278 patients. World neurosurgery. 2014 Dec 1;82(6):1187-97.

Conflicts of Interest: Nil Source of Funding: Nil

Citation: Kumar R, Dewan Y, Tiwari BK , Pandey SK. Evaluation of Clinical Profile and Functional Outcome Following Surgical Intervention in Third Ventricular Colloid Cyst: An Institutional Experience. National Journal of Medical and Allied Sciences 2020; 9(1): 30-35

Date of Submission: 17-06-2020

Date of Acceptance: 25-06-2020



A RETROSPECTIVE STUDY ON ROAD TRAFFIC ACCIDENTS DURING THE LAST DECADE (2009-2018) IN ASEER REGION, KSA

Abdlrhman Ibrahim Ali Asiri ¹, Abdlrhman Albarqi ², Waleed Alqrni ³, Khursheed Muzammil ⁴

^{1,2,3} Ex BPH student, College of Applied Medical Sciences, Khamis Mushait, King Khalid University, Abha, KSA

⁴Associate Professor, Public Health, College of Applied Medical Sciences, Khamis Mushayt Campus, King Khalid University, Abha, KSA

ABSTRACT

Introduction: Road traffic accidents (RTAs) add on to the global burden of the disease greatly. The prevalence of injuries & deaths due to RTA is a major concern of public health. This problem is alarming worldwide especially in Kingdom of Saudi Arabia. This study was undertaken to estimate the prevalence of Road Traffic Injuries & Deaths and to find out various factors precipitating Road Traffic Accidents in the Aseer region.

Material and Methods: It was a retrospective, descriptive study. Data was collected from the Traffic Police and Safety Department of Aseer for a period of 10 ten years starting from 2009 – 2018 which includes 289151 RTA cases. Ethical clearance was taken from the appropriate authority of King Khalid University. Study period was of four months. All the RTA cases registered with the Traffic Police & Safety Department during 2009-2018 constituted the sample size. A structured questionnaire has been used as a study tool to collect the consolidated data. Statistical analysis was done using Microsoft Excel and SPSS version 25.

Results: The prevalence of fatality and injuries because of RTAs has found to be 2.26% & 2.57%, respectively. Most of the RTA cases happened on Thursday and at day time within the city. The main reasons were the high speed of the vehicle and driving without attention.

Conclusion: The findings of the study are alarming and describe various important factors responsible for the increased cases of RTAs in the Aseer Region of KSA.

Key words: RTA, accidental deaths, injuries, high speeding

Author for correspondence: Dr. Khursheed Muzammil, E-mail: ktahir@kku.edu.sa, drkmb25@gmail.com

INTRODUCTION

A road traffic accident (RTA) is any injury due to crashes originating from, terminating with, or involving a vehicle partially or entirely on a public road. It is projected that road traffic injuries (RTIs) will be the third leading causes of the global disease burden by 2020. Recent estimate shows that there are about 6 million cars on the roads of KSA. According to MoH of KSA, 20% of beds are occupied by RTA victims and 81% of deaths are due to RTAs. The young males are affected most as reported in various studies during last 2.5 decades. The overall age-gender-adjusted

rate for non-fatal RTIs was 20.7/100 persons/year and was found to be higher in the 10 – 19 years age group. ¹ An audit of RTAs over one year revealed that 16% of the victims were less than ten years old, and 47% were between 11 - 30 years. ² Male to female ratio of 4:1 has also been reported, & attributed to the driving laws in KSA. ²

In KSA, RTA cases are high in Riyadh, Jeddah, Makkah, Madinah, and Qassim. ^{3, 4} A survey revealed that maximum (13.7%) RTAs occurred during December. ⁵ Another study reported that Ramadan is the most common month for RTAs. ⁶

A study in Riyadh revealed 83.4% of all of the trauma admissions during 1984-1989 were of RTAs. ⁷ With the above background this study was undertaken with the broad aim to find out the trend of Road Traffic Accidents in the Aseer region. The study objectives were:

1. To estimate the prevalence of Road Traffic Injuries & Deaths in the Aseer region, KSA.
2. To find out various factors precipitating Road Traffic Accidents in the Aseer region, KSA.

MATERIAL AND METHODS

Study Design: This was a record based retrospective descriptive study.

Study setting: All the Governorates of the Aseer region, Kingdom of Saudi Arabia.

Sampling Unit: A road traffic accident that took place anywhere in the Aseer region and which was reported to the Traffic Police & Safety Department also in the preceding ten years (2009 - 2018) constituted the sampling unit

Sample Size: All the registered RTA cases (2,89,151) with the Traffic Police and Safety Department, Aseer Region during 1st January 2009 and 31st December 2018 has been included.

Study tool: A structured questionnaire has been used as a tool to collect the consolidated related data of ten years. It contains the socio-demographic profile of the drivers, type of vehicles involved, no. of people injured in an accident, age of the drivers, effect or outcome of RTAs, time of occurrence, place of the event, weekdays of occurrence, the severity of the injury, reasons of accidents, types & status of license of drivers having RTAs, working condition of the vehicle, mechanisms of accidents, type of outcome of vehicle impact, etc.

Study period: This research has been completed within the prescribed timeline of 4 months.

Methodology: Due consent of the competent authority of the Traffic Police & Safety Department, Aseer Province was taken on our request through proper channel/ Dean of our

institution (College of Applied Medical Sciences, Khamis Mushait, KKU, Abha, Aseer, KSA) for providing the researchers of the current study with all the related data keeping the questionnaire attached in mind. The data gathered has been tabulated, analyzed suitably fulfilling the aim & objectives of the research in mind. The findings of the study have been disseminated/ communicated to generate awareness among students and community at large by conducting awareness campaigns at various colleges of King Khalid University, Abha, KSA, and at public places like markets & shopping malls.

Ethical approval: The ethical approval for the same has been taken by the competent authority of King Khalid University, Abha, through proper channel. Though this research has no intervention or experimentation on any animal or human being, the confidentiality of the details of accidental cases has been maintained strictly.

Statistical Analysis: The collected data will be checked twice for its correctness and entered in Microsoft Excel, and SPSS for suitable statistical analysis and inferences has been drawn accordingly.

RESULTS

The overall prevalence of injuries & death in all RTA cases has found to be 2.57% & 2.26 %, respectively. Year-wise RTAs trend has found to be highly significant. (Table-1) Maximum RTAs occurred on Saturday (15.9%) & Thursday (14.9%). (Figure - 1) Maximum RTAs occurred in the day time (59.9%). Maximum RTAs happened inside the city (66.1%). Maximum RTAs occurred with a car (48.1%) & mini truck (25.8%). (Figure - 2)

Maximum RTAs occurred with the drivers in the age group of 18-29 years (41.9%), and the majority were literate (96.7%). (Table-2) Maximum RTAs occurred with the drivers having an active car driving license. Maximum RTAs were because of high speed (27.8%) & driving without attention that too due to mobile use (15.2%). (Table-3) Maximum RTAs occurred due

to car crash (70.76%) & by hitting any fixed object (12.04%).

Table-1: Distribution of RTAs & its effects during 2009 - 2018. (N = 289151)

S. No.	Year	Outcome magnitude of RTA						Total
		No Damage		Injuries		Deaths		
		No.	(%)	No.	(%)	No.	(%)	
1	2009	28191	95.7	694	2.4	584	1.9	29469
2	2010	26372	94.5	714	2.6	807	2.9	27893
3	2011	29152	95.5	737	2.4	641	2.1	30530
4	2012	28320	95.0	759	2.5	722	2.4	29801
5	2013	29462	95.7	682	2.2	642	2.1	30786
6	2014	30547	95.2	830	2.6	710	2.2	32087
7	2015	31237	95.6	689	2.1	763	2.3	32689
8	2016	23795	94.3	803	3.2	647	2.5	25245
9	2017	24608	95.0	772	3.0	525	2.0	25905
10	2018	23460	94.8	753	3.0	533	2.1	24746
TOTAL (Row%)		275186	95.17	7433	2.57	6535	2.26	289151

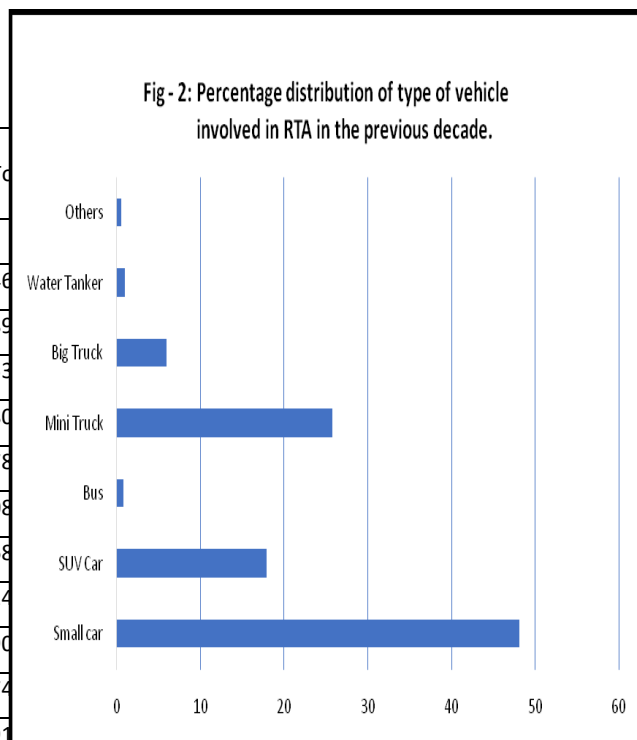


Fig - 1: Week days - wise distribution of RTA cases in the previous decade. (N = 289151)

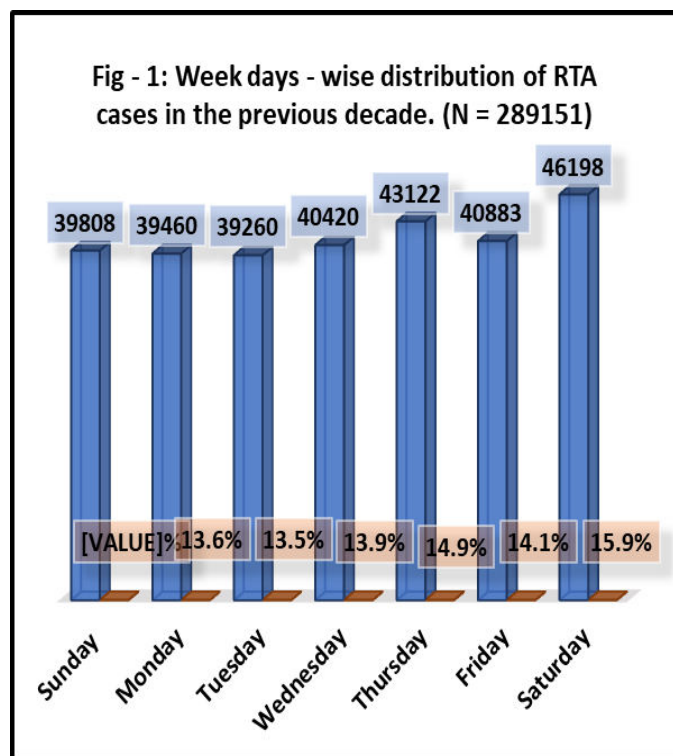


Table-2: Distribution of related traits of RTA cases during 2009 - 2018

Traits	Vehicles involved in RTA cases (N=489260)	
	No.	(%)
Age Group (In Years)		
< 18	30834	6.3
18-29	205056	41.9
30-39	151003	3.1
40-49	75574	15.4
≥50	26793	5.5
Total	489260	100.00
Nationality of RTA victims		
Saudi	371548	75.9
Non-Saudi	117712	24.1
Total	489260	100.00
Marital status		
Married	336483	68.8
Unmarried	152777	31.2
Total	489260	100.00
Educational status		
Literate	473002	96.7
Illiterate	16258	3.3
Total	489260	100.00

Table-3: Reasons of RTAs & working conditions of vehicles involved in RTAs during 2009 - 2018.

Reasons for RTAs & working conditions of vehicles	Vehicles involved in RTA cases (N=489260)	
	No.	%
A. Reasons for RTA		
Wrong parking/ stoppage	19001	3.9
Moving in the wrong direction	33012	6.7
Wrong overtake	26949	5.5
Breaking a traffic signal	3955	0.8
High speed	135963	27.8
Under the effect of drug/alcohol	104	0.02
Bursting of tire	36	0.01
Driving without attention (Mobile use)	74609	15.2
Others	14500	2.9
Not known	181111	37.02
Total	489260	100.00
B. Working conditions of the vehicle		
Lights not working	472	0.09
Break not working/ failure	737	0.15
Engine not good	269	0.05
Sudden mechanical fault	448	0.09
Good condition vehicle	487334	99.6
Total	489260	100.00

DISCUSSION

Many studies suggest that injuries are the leading causes of mortality & morbidity in the majority of the countries, and RTAs are one of the leading causes of death, hospitalization & disability.⁸⁻¹¹ Our study, the prevalence of injuries & death in all RTA cases came out to be 2.57% & 2.26% respectively & statistically significant also which is almost consistent with global scenario & consistent with similar findings in the above-mentioned studies. (Table- 1)

Our study revealed that the percentage of RTAs was more in the age group of 18 – 29 years, followed by 40 – 49 years. (Table - 2) However, in a study conducted by Bener AB (2012), the same was revealed as a 20 – 29 years age group.¹² Our results are also supported by other studies in which researchers found that young people were the most common victims of RTAs.^{13, 14-19} In a survey conducted by Mohtasham AZ et al. (2012), it was found that 59.2% of drivers who had RTA had the experience of more than ten years of

driving. However, other studies do not support it; instead, they stressed it to be five years while this was the limitation in our study as this aspect was not recorded.²⁰

As far as distraction habits while driving and driving without attention are concerned, we found that 15.2% of drivers who had RTAs were not paying due attention as required. (Table – 3) However, in a study conducted at Qatar that most (27.9%) of the injured drivers were distracted by eating or drinking while driving; this was followed by a large proportion of drivers (25.4%) who were using mobile phones (25.4%) or typing SMS/text messages (22.7%). Another study found that there was a 39% prevalence of distraction. The most prevalent distractions were due to interactions with another passenger, and it was more commonplace among drivers below 30 years of age or older than or equal to 50 years of age.^{20, 21} Another study showed that distractions could have varying influences on the crash type. More specifically, passenger-related and cellphone distractions are more likely in angular crashes. Whereas, for other electronic-device-related distractions, the most probable kind of collision is a single-vehicle crash; however, such results are the limitations of our study.²²

In a study, it has been reported that an increase of 1 km/h in the mean traffic speed results in a 3% increase in the incidence of injury crashes and a 4 – 5% increase in fatal crashes. This aspect is the limitation of data in our study.²³ In our study, a high percentage of those who were injured their main traffic violations were exceeding the speed limit (27.8%), parking violations (3.9%), and red-light violations (0.8%). (Table - 3) However, in another study, the same was found to 36.9%, 18.1%, and 13.4 %, respectively.²⁰ In our study, the most common mechanism of RTAs was found to be crash with a car (70.76%) followed by hitting a fixed object (12.04%). Our above findings are in contrast to another study in which researchers reported the highest occurrences of RTAs as overturn skid (20.7%) & hitting a fixed object (18.6%).²⁰

In the current study, injuries contributed 2.57% of all the RTAs. Whereas the same was found to be significantly high in another study as 15.1%.²⁰ In a study conducted in Mexico, surface injuries had the highest frequency. In contrast, data from Riyadh and the Armed Forces Hospital Al-Aseer reported a lower number of all types. Particularly head and neck injuries during 2001–2006; however, all these data were limited in our research as it was confined only to the data managed by traffic police and safety department and not by the hospital.^{13, 24} RTA cause disability in the short and long term, they are the ninth leading cause in the world of disability-adjusted life years, and they generate 41.2 million years of healthy life lost, thus accounting for 2.7% of the total worldwide.²⁴⁻²⁶ Accidents are responsible for 10% of death in the world, even higher than that of AIDS, malaria, and tuberculosis.²⁷ The Nigerian Federal Road Safety Corps estimated 3.7 deaths/ 100000 population for Nigeria in 2009.²⁸ In our study, the death rate was found to be comparatively almost similar to that of global average, i.e., 2.26% of the total RTAs in the Aseer region of the Kingdom of Saudi Arabia.

CONCLUSION

The findings are alarming and must attract the attention of the stakeholders specially policy makers to combat this problem and suggest suitable amendments in the current policies and further strengthening in the ongoing program for the prevention & control of Road Traffic Accidents leading to injuries and resulting deaths in the Aseer region of KSA. The findings of the research will benefit the community, academicians as well as policymakers to understand the various facts & factors related to RTAs. All the concerned stakeholders will be able to understand the factors related to RTAs in a better way which is required for the prevention of RTAs and hence act & plan accordingly to prevent further related injuries & loss of human life.

LIMITATION

This study is confined to the preceding ten years of data related to RTAs in the Aseer region only. For the generalization of the finding of this study, ideally multicentric field surveys across KSA must be undertaken.

RECOMMENDATIONS

There is a need to strengthen further the current system of traffic control and safety program in the Aseer Region to decrease the current RTAs further, which is almost static throughout the previous decade (2009 - 2018) in terms of RTA mortality. More awareness campaigns must be undertaken in the community with the help of mass media and social media. Inclusion of a separate comprehensive chapter in Moral Science or Environmental Science (EVS) on 'Prevention of Road Traffic Accidents & Road Safety' may be considered by the Ministry of Education in the course curriculum of the primary and middle schools as part of Primordial Prevention.

Acknowledgement:

The authors are thankful to the Traffic Police & Safety Department of Aseer Region, Abha, KSA, for providing us the required data related to RTAs they have for this research. We sincerely thank the Deanship of Scientific Research of King Khalid University, The Dean as well as HOD (Public Health) of the College of Applied Medical Sciences, Khamis Mushait Campus, King Khalid University, Abha, KSA for all the technical support and help in the completion of this exhaustive and comprehensive research work.

REFERENCES:

1. Barrimah I, Midhet F, Sharaf F. Epidemiology of Road Traffic Injuries in Qassim Region, Saudi Arabia: Consistency of Police and Health Data. *Int J Health Sci (Qassim)* 2012; 6: 31-41.
2. Shanks NJ, Ansari M, Al-Kalai D. Road traffic accidents in Saudi Arabia. *Public Health* 1994; 108: 27-34.

3. Isam S, Al Ghamdi A. Analysis of injuries resulting from road traffic accidents in Riyadh district. *King Saud Magazine-Engineering Science* 1996; 8: 235-250.
4. Al-Naami MY, Arafah MA, Al-Ibrahim FS. Trauma care systems in Saudi Arabia: an agenda for action. *Ann Saudi Med* 2010; 30: 50-58.
5. Qayed MH. Epidemiology of road traffic accidents in Al Ahsaa Governorate, Saudi Arabia. *East Mediterranean Health Journal* 1998; 4: 513-520.
6. Khan ZU, Al Asiri KM, Iqbal J. Injury patterns from road traffic accidents. *Pakistan Journal of Medical Sciences* 2010; 26: 394-397.
7. Messahel F, Seraj M, al-Qasabi Q, el-Bakry AK. Trauma cases admitted to the surgical intensive care unit--progress and outcome. *Middle East J Anesthesiol* 1996; 13: 585-591.
8. Appenzeller GN. Injury patterns in peacekeeping missions: the Kosovo experience. *Mil Med* 2004; 169:187-191.
9. Bonilla-Escobar FJ, Gutierrez MI. Injuries are not accidents: towards a culture of prevention. *Colomb Med (Cali)* 2014; 45:132-135.
10. Zimmerman K, Jinadasa D, Maegga B, Guerrero A. RTI on rural roads in Tanzania: measuring the effectiveness of a road safety prog. *Traffic InjuryPreven* 2015; 16:456-460.
11. Soori H, Ainy E, Bazargan-Hejazi S. Opportunities, threats & barriers to enacting mandatory child car restraint laws in Iran. *Int J InjuryContr Safe Promot* 2015; 22:314-319.
12. Bener AB. A study on road traffic crashes and injuries in Qatar as reported by drivers. *J Egypt Public Health Assoc* 2012; 87:85-89.
13. Hajar M, Arredondo A, Carrillo C, Solorzano L. Road traffic injuries in an urban area in Mexico: an epidemiological and cost analysis. *Accid Anal Prev* 2004; 36:37-42.
14. Abbasi HR, Mousavi SM, Taheri Akerdi A, Niakan MH, Bolandparvaz S, Paydar S. Pattern of traumatic injuries and injury severity score in a major trauma center in Shiraz, Southern Iran. *Bull Emerg Trauma*, 2013; 1:81-85.
15. ModarresSR, ShokrollahiMH, YaserianM, RahimiM, AmaniN, ManouchehriA. Epidemiological characteristics of fatal traumatic accidents in Babol, Iran: a hospital-based survey. *Bull Emerg Trauma*, 2014; 2:146-150.
16. Heydari ST, Hoseinzadeh A, Ghaffarpasand F, Hedjazi A, Zarenezhad M, Moafian G, et al. Epidemiological characteristics of fatal traffic accidents in Fars province, Iran: a community-based survey. *Public Health* 2013; 127: 704-709.
17. Anh TT, Dao N, Anh T, editors. The cost of a road traffic accident in Vietnam. In: *Proceedings of the Eastern Asia Society for Transportation Studies* 2005
18. Ghaffar A, Hyder AA, Masud TI. The burden of road traffic injuries in developing countries: the 1st national injury survey of Pakistan. *PublicHealth*, 2004; 118:211-217.
19. Giorgi Rossi P, Farchi S, Chini F, Camilloni L, Borgia P, Guasticchi G. Road traffic injuries in Lazio, Italy: a descriptive analysis from an emergency department-based surveillance system. *Ann Emerg Med* 2005; 46:152-157.
20. Mohtasham-Amiri Z, Dastgiri S, Davoudi-kiakalyeh A, Imani A, Mollarahimi K. An epidemiological study of road traffic accidents in Guilan Province, Northern Iran in 2012. *Bull Emerg Trauma*, 2016; 4:230-235.
21. Griffin R, Huisingh C, McGwin G Jr. Prevalence of and factors associated with distraction among public transit bus drivers. *Traffic InjPrev* 2014; 15:720-725.

22. Mahtab G, Ng BL. The influence of driver distractions on the likelihood of rear-end, angular, and Single-vehicle crashes in Missouri. Transportation Research Board Annual Meeting Paper #09- 3397 2009
23. Cameron MH, Vulcan AP, Finch CF, Newstead SV. Mandatory bicycle helmet use following a decade of helmet promotion in Victoria, Australia – an evaluation. *Accid Anal Prev* 1994; 26:325–337.
24. Bendak S. Seat belt utilization in Saudi Arabia and its impact on road accident injuries. *Accid Anal Prev* 2005; 37:367–371.
25. Murray CJL, Lopez. Alternative projections of mortality and disability by cause 1990 –2020: Global Burden of Disease Study. *Lancet*, 1997; 349:1498,–1504.
26. World Health Organization (Internet). World report on road traffic injury prevention. [Accessed 20 Jan 2020]
27. Majdzadeh R, Khalagi K, Naraghi K, Motevalian A, Eshraghian MR. Determinants of traffic injuries in drivers and motorcyclists involved in an accident. *Accid Anal Prev* 2008; 40:17–23.
28. World Health Organization. Global status report on road safety 2013: supporting a decade of action (PDF) (in English and Russian). Geneva ,Switzerland: WHO; 2013.

Conflicts of Interest: Nil Source of Funding: Nil

Citation: Asiri AIA, Albarqi A, Alqrni W, Muzammil K. A Retrospective Study on Road Traffic Accidents during the Last Decade (2009-2018) in Aseer Region, KSA. *National Journal of Medical and Allied Sciences* 2020; 9(1): 36-42

Date of Submission: 22-06-2020

Date of Acceptance: 10-07-2020



PREOPERATIVE SKIN PREPARATION WITH POVIDONE IODINE 10% AND ITS EFFECT ON RESIDENT BACTERIAL FLORA OF SKIN

Rooman A. Rana

Assistant Professor, Department of Surgery, Integral Institute of Medical Sciences and Research, Integral University, Lucknow

ABSTRACT

Introduction: Preoperative skin preparation is an inalienable part of the patient preparation in any orthopaedic surgery. The obvious goal of this step is to reduce the possibility of a postoperative wound infection. Unfortunately, guidelines/recommendations to achieve these goals are still to be universally agreed upon. The aim of the study was to determine Preoperative skin preparation with Povidone Iodine 10% and its effect of resident bacterial flora of skin.

Material and Methods: The study was conducted in Mahatma Gandhi hospital attached to Dr. S.N. Medical College, Jodhpur among 150 patients undergoing various surgical procedures. Those patients with an open wound or current infection were excluded. Two different protocols of preoperative application of povidone iodine 10% and its effect on resident bacterial flora (RBF) of skin were followed. Ethical approval was obtained from the institutional ethical and research review committee. Data entry and statistical analysis were performed using the Microsoft Excel.

Results: Overall infection rate in clean cases prepared according to both protocols of skin preparation combined was 6%, infection rate in clean contaminated group was 30% and infection rate in contaminated group was 30%. Skin preparation protocol A was slightly more effective than protocol B in clean wound groups and skin preparation protocol A was 3 times more effective than protocol B in eliminating resident bacterial flora in clean contaminated wound group. Both the clean wound group and clean contaminated wound group protocol A had higher number of patients experiencing mild pain or no pain. Protocol A of skin preparation was better than protocol B in relation to post operative pain in contaminated group.

Conclusion: Though no single preoperative skin preparation protocol is an answer to all types of surgery. In the light of the above results, this study suggests that povidone iodine PVPS 10% solution base protocol A of skin preparation is more cost effective and is also significantly better in decreasing the amount of postoperative pain and discomfort to the patients, and reducing the postoperative infection in all type of

Author for correspondence: Dr Rooman A. Rana Email:drroomanrana@gmail.com

INTRODUCTION:

Surgical site infection (SSI) complicates an projected 5% of all clean-contaminated operations performed yearly in US hospitals and accounts for the most common nosocomial infection in surgical patients.⁽¹⁾ Patients who develop SSI have longer and costlier hospitalizations and are more probable to spend time in an intensive care unit (ICU), are five times more probable to be readmitted, and are twice as expected to die.⁽²⁾ Recognizing this substantial morbidity and economic load, in 1999 the Centers for Disease

Control (CDC) issued standardized rules for the prevention of surgical infections. These included making precise evidence-based recommendations for modifying patient reasons that may predispose to infection, for the use of antimicrobial prophylaxis, for optimizing sterility in the operating room, and for the use of antiseptic agents for skin preparation. The choice of which specific agent to use for skin preparation was not addressed due to the multiplicity of sites and approaches in surgery, as well as the nonattendance of data on SSI risk in well-

controlled, operation-specific studies.⁽¹⁾ Therefore, the choice of agent should be based mainly on the surgeon's information of the product's efficacy, cost, and ease of use. Urologic surgeons have the supplementary challenge of choosing the best agent for the variety of procedures that they perform, including intra peritoneal and extra peritoneal surgery; scrotal, perineal, and vaginal operations; endoscopy; and percutaneous renal surgery. Each of these operative sites has dissimilar endogenous flora, body contours, and skin types, all factors that affect the risk of SSI and, consequently, the best type of antiseptic skin agent to use. Surgical infections are a potentially devastating complication of any type of invasive procedure. An effective pre surgical skin preparation with a topical bactericidal agent is an important step in limiting surgical wound contamination. The purpose of the study was to evaluate resident bacterial skin contamination, and its effect on post operative outcome of patients, following pre operative skin preparation with 10% three application one day prior to surgery vs single application just prior to surgery.

MATERIAL AND METHODS

The study was conducted in Mahatma Gandhi hospital attached to Dr. S.N. Medical College, Jodhpur on 150 patients undergoing various surgical procedures. Those patients with an open wound or current infection were excluded. Two different protocols of preoperative application of povidone iodine 10% and its effect on resident bacterial flora (RBF) of skin were followed. Total number of cases, were divided into the following groups :

Protocol A (75 cases): The surgical site infection was painted with 10% three times, at an interval of 8 hours, one day prior to surgery, its effect on RBF of skin by taking control swab and test swab.

Protocol B (75 cases): The surgical site infection was painted with 10%, one application, on the day of surgery, just prior to surgery by taking control swab and test swab.

Both the groups, were further divided into, three subgroups (contaminated group was studied with grossly contaminated group). Clean (25 cases), clean contaminated (25 cases) and contaminated (25 cases).

Methods of sampling for RBF: Autoclaved, moist surface swab, moistened in sterile culture media, was rubbed over the surgical site infection (SSI)

and replaced back in to the labelled test tube containing sterile culture medium. Test tube containing culture medium along with sent to the microbiology laboratory.

Ethical consideration:

Ethical approval was obtained from the institutional ethical and research review committee. Informed written consent was taken from all respondents after full explanation of the nature, purpose and all procedures used for the study. Confidentiality of participants was maintained at all times.

Statistical analysis:

Data entry and statistical analysis were performed using the Microsoft Excel. Data and characteristics were tabulated as descriptive statistics, group statistics explained by frequency and percentages.

RESULTS:

Table 1: Comparison of resident bacterial flora with respect to preoperative skin preparation protocols

Type of skin preparation protocol	Type of sample (Surface swab)	Results of culture of surface swab for resident bacterial flora	
		Positive n (%)	Negative n (%)
A	Control (75 Cases)	75(100.0)	0(0.0)
	Test (75 Cases)	9(12)	66(88)
B	Control (75 Cases)	75(100.0)	0(0.0)
	Test (75 Cases)	21(28)	54(72)

Table 1 shows that comparison was done regarding presence of resident bacterial flora according to protocol A of preoperative skin preparation versus protocol B. Preparative skin protocol A and B, in which surface slab from surgical site of incision control swab culture was positive for resident bacterial flora, in all 75 cases studied as compared to 9(12%) and 21 (28%) positive for resident bacterial flora in test swab culture.

Table 2 shows that comparison was done regarding presence of resident bacterial flora clean wounds, clean contaminated wounds, contaminated wounds groups according to protocol A of preoperative skin preparation versus protocol B. It shows 0% and 12% positive for resident bacterial flora in test swab culture in protocol A and B in clean wound groups respectively. Hence, on comparison we found that

skin preparation protocol A is slightly more effective than protocol B in clean wound groups and skin preparation protocol A is 3 times more effective than protocol B in eliminating resident bacterial flora in clean contaminated wound group. Ratio of test swabs positive for resident bacterial flora for two preoperative skin preparation protocol A:B is 1:1.5 in contaminated wounds.

Table 2: Comparison of resident bacterial flora with respect to type of wound in both preoperative skin preparation protocols

Type of skin preparation protocol	Type of sample (Surface swab)	Results of culture of surface swab for resident bacterial flora					
		Clean wounds		Clean contaminated wounds		contaminated wounds	
		Positive n(%)	Negative n(%)	Positive n(%)	Negative n(%)	Positive n(%)	Negative n(%)
A	Control	25 (100.0)	0 (0.0)	25 (100.0)	0 (0.0)	25 (100.0)	0 (0.0)
	Test	0 (0.0)	0 (0.0)	3 (12)	22 (88)	6(24)	19 (76)
B	Control	25 (100.0)	0 (0.0)	25 (100.0)	0 (0.0)	25 (100.0)	0 (0.0)
	Test	3 (12)	22 (88)	9 (36)	16 (64)	9 (36)	16 (64)

clean cases prepared according to both protocols of skin preparation combined is 6%, infection rate in clean contaminated group is 30% and infection rate in contaminated group is 30%.

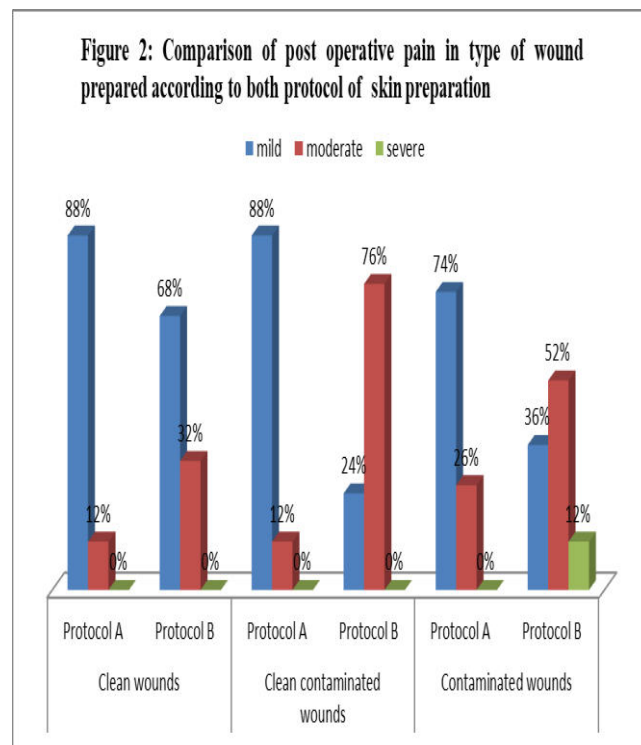


Figure 2 illustrates that the comparison was done regarding post operative pain in clean wounds, Clean contaminated wounds and contaminated wounds groups according to protocol A of preoperative skin preparation versus protocol B of preoperative skin preparation. In clean wound group protocol A has higher number of patients experiencing mild pain or no pain. Same in clean contaminated wound group protocol A has higher number of patients suffering mild pain or no pain. Protocol A of skin preparation is better than protocol B in relation to post operative pain in contaminated group.

DISCUSSION

Surgical site infections are relentless and preventable health care-associated infections. There has been growing demand for evidence-based interventions for the prevention of SSI. The prevention of SSI is increasingly significant as the number of surgical procedures completed is on the rise and associated morbidity for the patients due SSI and its effect on the overall cost of healthcare is more. Considering it essential for establishment of preventive policies for SSI control the present study aimed at determine Preoperative skin

Figure 1: Incidence of post operative wound infection in relation to the type of wounds

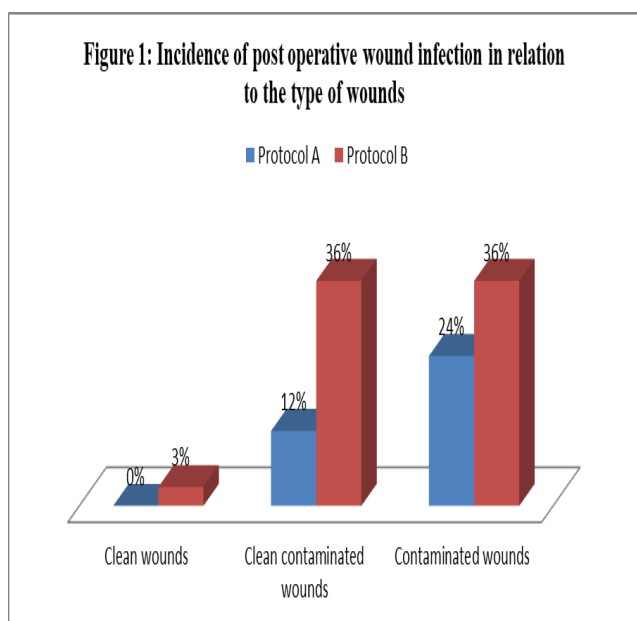


Figure 1 illustrates that the clinical infection in clean wounds, Clean contaminated wounds, contaminated wounds groups prepared according to protocol A of skin preparation are 0%, 12% and 24% , while in protocol B of skin preparation are 12%, 36% and 36%. The overall infection rate in

preparation with povidone iodine 10% and its effect of resident bacterial flora of skin.

In present study preparative skin protocol A and B, in which surface slab from surgical site of incision, in all 75 cases studied as compared to 9(12%) and 21 (28%) positive for resident bacterial flora in test swab culture. In addition, development of surgical site infections can broadly be considered due to bacterial contamination during the surgery, the duration of the procedure, or underlying diseases such as immune deficiency, diabetes, and malnutrition etc (which would predispose the patient to an infection).⁽³⁾ Das et al reported that the overall rate of surgical site infection was considerably lower in the chlorhexidine group (12.3%) than in the povidone iodine group.⁽⁴⁾

In present study the overall infection rate in clean cases prepared according to both protocols of skin preparation combined is 6%, infection rate in clean contaminated group is 30% and infection rate in contaminated group is 30%. Although the WHO states that “there is no single, objective gold standard test for surgical wound infection”, majority follow either the US CDC criteria or the European ECDC guidelines to define surgical site infection.⁽⁵⁾ Since the patient’s skin can contribute as an important source of pathogens that cause surgical site infection, optimization of preoperative skin antisepsis may decrease postoperative infections.⁽⁶⁾ Surgical site infection (SSI) is a dreaded postoperative complication that affects approximately 5% of all patients undergoing surgery.⁽⁷⁾ It is associated with prolonged length of hospital stay, prolonged postoperative recovery time, higher hospital readmission rates, and higher morbidity and mortality rates than patients without SSI.⁽⁸⁾ The majority of SSIs are caused by contamination of a surgical incision with bacteria from the patient’s own body.⁽⁹⁾ The recent WHO guideline prefers alcoholic chlorhexidine solution over povidone iodine for pre-surgical use.^(10,11) However to its rapid, potent, broad-spectrum antimicrobial properties, and favorable risk/benefit profile, povidone iodine is expected to remain a highly effective treatment for acute and chronic wounds in the foreseeable future.¹²

CONCLUSION

Though no single preoperative skin preparation protocol is an answer to all types of surgery. In the

light of the above results, present study definitely says that povidone iodine PVPS 10% solution base protocol A of skin preparation with added advantage is more cost effective i.e., bringing down the amount spend by the patients on dressings and decreasing the amount of postoperative pain and discomfort to the patients, is also significantly better in reducing the postoperative infection in all type of wounds as compared to routine protocol B.

REFERENCES

1. Mangram AJ, Horan TC, Pearson ML, et al. Guideline for prevention of surgical site infection, 1999. Hospital Infection Control Practices Advisory Committee. *Infect Control Hosp Epidemiol.* 1999;20:250–278. quiz 279–280.
2. Kirkland KB, Briggs JP, Trivette SL, et al. The impact of surgical-site infections in the 1990s: attributable mortality, excess length of hospitalization, and extra costs. *Infect Control Hosp Epidemiol.* 1999;20:725–730.
3. Dunn DL, Beilman GJ. Surgical infections. In: Brunicki FC, Andersen DK, Billiar TR, Dunn DL, Hunter JG, Matthews JB, et al, editors. *Schwartz’s principles of surgery.* 8th ed. New York: McGraw-Hill, 2005, 109-28.
4. Das A, Samant S, Dash P. A comparison study of preoperative skin preparation using chlorhexidine vs povidone iodine in cases of elective orthopaedic surgery. *International Journal of Orthopaedics Sciences* 2017; 3(2): 12-15
5. Global guidelines on the prevention of surgical site infection [Internet]. World Health Organization. 2017 [cited 20 February 2019]. Available from: <http://www.who.int/gpsc/ssi-prevention-guidelines/en/>
6. Darouiche RO, Wall MJ Jr, Itani KM, et al. Chlorhexidine-Alcohol versus Povidone-Iodine for Surgical-Site Antisepsis. *N Engl J Med.* 2010; 362(1):18-26.
7. Gottrup F. Prevention of surgical-wound infections. *N Engl J Med* 2000;342(3):202–4.
8. Kirkland KB, Briggs JP, Trivette SL, Wilkinson WE, Sexton DJ. The impact of surgical-site infections in the 1990s: attributable mortality, excess length of hospitalization, and extra costs. *Infect Control Hosp Epidemiol* 1999;20(11):725–30.
9. National Collaborating Centre for Women’s and Children’s Health. National Institute for Health and Clinical Excellence: guidance.

Surgical site infection: prevention and treatment of surgical site infection. London: RCOG Press; 2008

10. WHO. Global Guidelines for the Prevention of Surgical Site Infection. ISBN 978 92 4 154988 2 World Health Organization 2016. Available at <https://apps.who.int/iris/bitstream/handle/10665/250680/9789241549882-ita.pdf> (Last accessed 21-6-2020)

11. Allegranzi B, Zayed B, Bischoff P, Kubilay NZ, de Jonge S, de Vries F, et al.. WHO Guidelines Development Group, New WHO recommendations on intraoperative and postoperative measures for surgical site infection prevention: an evidence-based global perspective Lancet Infect. Dis. 2016; 16: e288-e303

12. Bigliardi PL, Alsagoff SAL, El-Kafrawi HY, Pyon JK, Wa CTC, Villa MA. Povidone iodine in wound healing: a review of current concepts and practices. Int J Surg. 2017;44:260-268.

Conflicts of Interest: Nil Source of Funding: Nil

Citation: Rana RA. Preoperative Skin Preparation With Povidone Iodine 10% And Its Effect On Resident Bacterial Flora Of Skin. . National Journal of Medical and Allied Sciences 2020; 9(1): 43-47

Date of Submission: 21-05-2020

Date of Acceptance: 31-06-2020