

Association of Acute Otitis Media with Breast Feeding Position Among Infants in a Tertiary Care Hospital of Pakistan

Samia Tul Rasool, Sana Mansoor, Tayyab Mumtaz Khan, Ashar Alamgir, Maida Meer, Fakeha Masood, Shahrukh Khan, Madeeha Mumtaz, Jehanzeb Akram, and Hina Mansoor

ABSTRACT

Acute otitis media (AOM) is the commonest disease of childhood. High incidence of AOM might be due to immature Eustachian Tube and immaturity of immune system. Exclusive breast feeding is protective against acute otitis media, however, improper breastfeeding position can increase AOM occurrence in infants. This study aims to assess the association of improper breastfeeding position with occurrence of Acute otitis media in infants and to assess association of Maternal educational levels with feeding positions. 220 breastfed infants satisfying inclusion criteria with diagnosed AOM were enrolled. Study was conducted over a period of 6 months from August 2019 to January 2020. Demographic details and Detailed history regarding feeding positions and maternal educational levels were obtained through a Self-structured proforma from parents. Data analysis was done through descriptive statistics and chi square test and p value less than 0.5 was set significant. Out of 220 infants, 123(55.90%) were male and 97(44.10%) were females. AOM was more common in male infants than female infants, however it was not statistically significant($p=0.169$). The mean age for enrolled infants(1-12months) was $6.90(\pm 3.413)$. Statistically significant association between increase incidence of AOM and breastfeeding position was found($p=0.032$). We also found a statistically significant association between maternal educational levels and breastfeeding position ($p=0.000$). In this study, we have noted that Breastfeeding in supine position is associated significantly with increase in incidence of AOM. Feeding positions are statistically associated with Maternal Educational levels.

Keywords: Association, Acute Otitis Media, Infants, Breastfeeding position Tertiary care Hospital.

Published Online: November 21, 2020

ISSN: 2593-8339

DOI: 10.24018/ejmed.2020.2.6.563

Samia Tul Rasool

Rawalpindi Medical University, Pakistan.

Sana Mansoor

Rawalpindi Medical University, Pakistan.

Tayyab Mumtaz Khan*

Rawalpindi Medical University, Pakistan.

(e-mail: tayyab.mkhan98@gmail.com)

Ashar Alamgir

District Headquarter Hospital, Pakistan.

Maida Meer

Federal Medical and Dental College Islamabad, Pakistan.

Fakeha Masood

Rawalpindi Medical University, Pakistan.

Shahrukh Khan

University of Veterinary and Animal Sciences, Pakistan.

Madeeha Mumtaz

Lahore College for Women University, Pakistan.

Jehanzeb Akram

Rahbar Medical and Dental College, Pakistan.

Hina Mansoor

National University of Modern Languages, Islamabad, Pakistan.

**Corresponding Author*

I. INTRODUCTION

Acute Otitis Media (AOM) is the commonest infection of childhood affecting children before 5 years of age. Acute otitis media is defined clinicopathologically as inflammation of the mucoperiosteal lining of middle ear cleft of rapid onset, infective in origin, and associated with a middle ear effusion, and a varied collection of clinical symptoms, which include ear discharge, fever, irritability, earache, ear pulling and excessive crying [1-4]. Studies have shown that 80% of children will have experienced at least one episode of AOM by their 3rd year [5]. AOM is also accountable for main cause of hospital visits and antibacterial medicine [6]. As indicated by one report, the global frequency pace of AOM is 10.85% with 709 million, cases per year of which children aged under 5 years contributed 51%. Additionally, an investigation directed in 2005 indicated AOM frequency of

14.52% and 8.67% in South Asia and North Africa respectively [1]. Studies showed that the AOM load is most elevated between 6-12months of age [7], [8]. This might be owing to their weak immune system and immature Eustachian Tube anatomically and physiologically [3]. This rising incidence of AOM is the burden on health care system, leading to their exhaustion [1,5,9]. It also increases antibiotic resistance [10].

Multiple factors contributing to the causation of AOM are younger age, male sex, parental or sibling history of otitis media, reduced duration of breastfeeding, overcrowding, daycare attendance, recurrent upper respiratory infections, snoring, allergic rhinitis, pacifier use, household parental smoking, parental education, and low socioeconomic status [11]-[15]. Different studies have been conducted, determining the association of AOM and breastfeeding and have concluded that breastfeeding protects against AOM

until 2 years of age with the greatest protection provided by exclusive breastfeeding [16]-[19]. The Association of inaccurate feeding posture has been correlated with an increase in the risk of AOM in various studies [3], [20]-[21].

This study in view of above aims to assess the association of feeding position (supine and upright of head) with occurrence of acute otitis media. The result of this study may provide primordial level of intervention in prevention of acute otitis media in infants and consequently reduction of economic burden to everyday health care system particularly of developing countries that cannot bear this economic burden over their health systems and emotional stability among caregivers.

II. MATERIAL AND METHODS

This descriptive cross-sectional study was conducted through simple Convenient sampling at District Head Quarters Hospital, Rawalpindi from September, 2019 to February, 2020 (with duration of 6 months) on diagnosed patients of AOM with the age up to 1 year old. Informed consent was taken from parents of infants prior to fill the questionnaire and anonymity was insured. Total of 220 Children up to age of 1 year with diagnosed AOM and breastfed were included in this study while those suffering from congenital Abnormalities i.e. Cleft palate, Cleft lip, Cranio-facial anomalies, and hearing loss were excluded. A self-structured Proforma was applied to get information regarding the age, gender, position of infants while feeding (upright or supine) and maternal educational level. Statistical package for social sciences (Version 25) was used for data entry and analysis. Descriptive and Inferential Statistics along with chi square test and t independent test were applied.

III. RESULTS

This study included total of 220 infants with diagnosed AOM, out of which 123(55.90%) were male and 97(44.10%) were females. Although Prevalence was more among male infants than female infants, but it was not statistically significant($p=0.169$). This gender wise distribution trend of AOM among infants is shown in Fig. 1.

The age of included children was between 1 and 12 months with mean age of $6.90(\pm 3.413)$. Four groups were made of infants on the basis of age. which included age of 1-3, 4-6, 7-9 and 10-12 (months). Highest incidence of AOM was among infants with age between 10-12 followed by 7-9 (months). This age wise distribution trend of AOM is shown in Fig. 2.

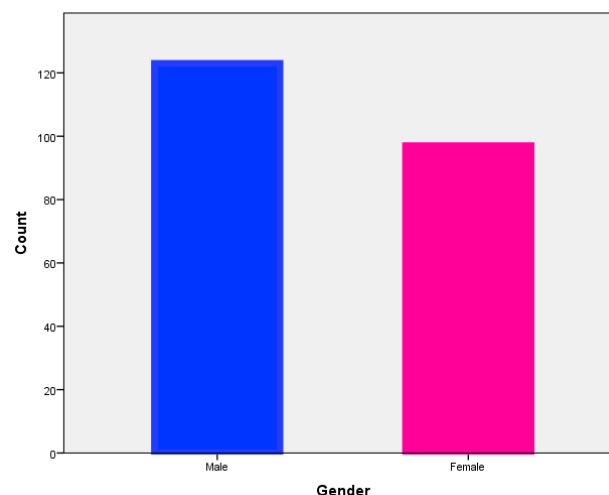


Fig. 1. Gender Wise Distribution of Acute Otitis Media.

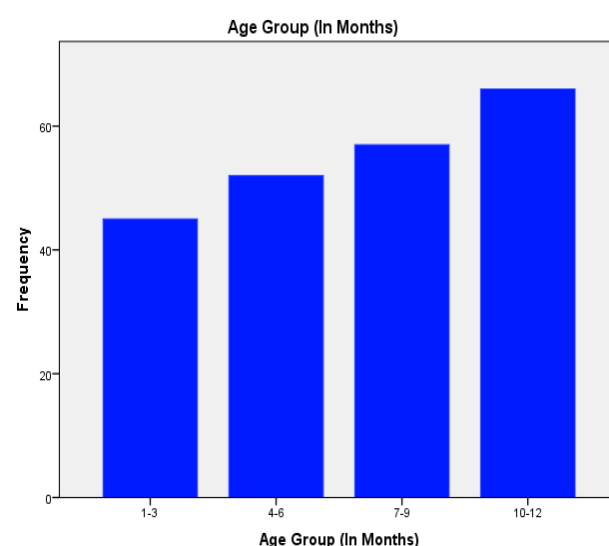


Fig. 2. Age Wise Distribution Trend of Acute Otitis Media.

Out of total 220 infants 127(55.90%) were breastfed in supine position while 93(44.10%) were breastfed in upright position. Association between the AOM in different age groups and position of breastfeeding was statistically significant ($p=0.032$) through Chi square analysis with highest occurrence of AOM was among infants with age of 10-12 months (cases=45) followed by infants with age of 7-9 months (cases =36). This age wise distribution of AOM with different position different breast feeding position is shown in Table.1

TABLE: 1 AGE WISE DISTRIBUTION OF AOM AMONG INFANTS ALONG WITH VARIOUS BREAST FEEDING POSITION

Age Group (In Months)	Position of Breastfeeding		Total
	Upright	Supine	
1-3	26 (58%)	19(42%)	45
4-6	25(48%)	27(52%)	52
7-9	21(37%)	36(63%)	57
10-12	21(32%)	45(68%)	66
Total	93(42%)	127(58%)	220

Our Study also found that maternal education level and position of breast feeding had also association which was statistically significant ($p=0.000$) through Chi square

analysis. Highest number of infants 33(15%) were breastfed in upright position among mothers with education level of above matric and highest number of infants 67(30.45%) were breastfed in supine position among illiterate mothers or without formal education. This association between maternal education level and position of breast feeding is shown in Table 2.

TABLE 2: ASSOCIATION BETWEEN MATERNAL EDUCATION AND BREAST FEEDING POSITION OF INFANT

Maternal Educational Level	Position of Breastfeeding		Total
	Upright	Supine	
Illiterate	24(26%)	67(74%)	91
Primary	11(31%)	24(69%)	35
Matric	25(56%)	20(44%)	45
Above Matric	33(67%)	16(33%)	49
Total	93(42%)	127(58%)	220

IV. DISCUSSION

The results of our study provide valuable information regarding the gender wise distribution of incidence of AOM, age wise distribution of incidence of AOM, association between incidence of AOM and breast feeding position, and association between breast feeding position with maternal educational status. AOM is a commonest illness among childhood with the best incidence in the first year of life, with the peak incidence in the second 6 months in most studies and the frequency gradually declines as the age increases [3]. In our study similar finding is observed, majority cases were found to be between 10-12 followed by 7-9 months of age. A study that was conducted in India also showed that occurrence of AOM was most noteworthy among children of 7-9 months age group [3]. Although prevalence was more among male infants than female infants however it was not statistically significant ($p=0.169$). So, no relationship between gender and AOM was noted in our study. However, in literature, a study that was conducted in United States of America concluded that male sex is an important predictor for AOM in first year of life but not in second or third year of life [8]. In our study we observed that infants were breastfed in both supine and upright positions however significant association was found only between supine posture and incidence of AOM ($p=0.032$). Several studies have also concluded the association of abnormal feeding posture and greater risk of otitis media. A study conducted in India, reported similar finding that faulty feeding position increases the risk of otitis media [20]. In literature another, Indian study showed that, babies who were fed in lying posture were prone to develop AOM [3]. Besides, similar finding in different studies as mentioned above, in literature review a conflicting finding was also noticed in a study that breast feeding is not associated with increased risk of AOM [22]. Upon further analysis, it was observed that there was a strong association between mother education level and feeding posture and it was statistically significant ($p=0.000$). Highest number of infants 33 (15%) were breastfed in upright position among mothers with education level of above matric and highest number of infants 67 (30.45%) were breastfed in supine position among illiterate mothers. Similar relation between incidence of AOM and parental education has also been reported in another study [14]. This

trend could be seen because being not formally educated, mothers would not have enough knowledge and are unaware about proper way of breastfeeding. Furthermore, since most of the women are occupied by household chores, they may not get an exposure to healthcare facilities available to them. Also, there are still certain backward areas where women, due to family pressures, are not able to reach out to breast feeding clinics to learn about the appropriate technique. So, after this study we can say that by increasing the maternal knowledge and education during antenatal visits and immediate postnatal period regarding healthy breast feeding practices with proper positioning of baby's head that would lead to considerably reduction in incidence of AOM in infants.

V. CONCLUSION

This study indicates inappropriate breastfeeding position (supine) is associated with increased incidence of AOM among infants. Significant association between maternal education level and breastfeeding position has also been observed. Improper breastfeeding position was more common among illiterate while proper feeding position (upright) was more common among mothers with higher education level. Adaptation to Proper breastfeeding position and by increasing mother's education level, incidence of AOM could be reduced.

REFERENCES

- [1] Monasta L, Ronfani L, Marchetti F, Montico M, Brumatti LV, Bavcar A, Grasso D, Barbiero C, Tamburlini G: Burden of disease caused by otitis media: systematic review and global estimates. *PLoS one* 2012, 7(4).
- [2] Palmu AA, Herva E, Savolainen H, Karma P, Mäkelä PH, Kilpi TM: Association of clinical signs and symptoms with bacterial findings in acute otitis media. *Clinical infectious diseases* 2004, 38(2):234-242.
- [3] Regina M, Radhamani K, Sanu MP, Arun G, Mohan M: Correlation of acute suppurative otitis media with infant feeding position.
- [4] Rovers MM, Schilder AG, Zielhuis GA, Rosenfeld RM: Otitis media. *The Lancet* 2004, 363(9407):465-473.
- [5] Teele DW, Klein JO, Rosner B, Group GBOMS: Epidemiology of otitis media during the first seven years of life in children in greater Boston: a prospective, cohort study. *Journal of infectious diseases* 1989, 160(1):83-94.
- [6] Rovers, M.M., 2008. The burden of otitis media. *Vaccine*, 26, pp. G2-G4.
- [7] Duffy, L.C., Faden, H., Wasielewski, R., Wolf, J. and Krystofik, D., 1997. Exclusive breastfeeding protects against bacterial colonization and day care exposure to otitis media. *Pediatrics*, 100(4), pp.e7-e7.
- [8] Kaur, R., Morris, M. and Pichichero, M.E., 2017. Epidemiology of acute otitis media in the postpneumococcal conjugate vaccine era. *Pediatrics*, 140(3), p.e20170181.
- [9] Wang Z, Xie Z, Dai J, Zhang L, Huang Y, Chen B: Physician burnout and its associated factors: a cross-sectional study in Shanghai. *Journal of occupational health* 2014:13-0108-OA.
- [10] Al-Marzoqi AH, Al-Janabi HSO, Hussein HJ, Al Taei ZM, Yheea SK: Otitis media; etiology and antibiotics susceptibility among children under ten years old in Hillah city, Iraq. *Journal of Natural Sciences Research* 2013, 3(3):2224-3186.
- [11] Sophia A, Isaac R, Rebekah G, Brahmadathan K, Rupa V: Risk factors for otitis media among preschool, rural Indian children. *International journal of pediatric otorhinolaryngology* 2010, 74(6):677-683.
- [12] Warren JJ, Levy S, Kirchner H, Nowak A, Bergus GR: Pacifier use and the occurrence of otitis media in the first year of life. *Pediatric dentistry* 2001, 23(2):103-108.
- [13] Amani S, Yarmohammadi P: Study of effect of household parental smoking on development of acute otitis media in children under 12 years. *Global journal of health science* 2016, 8(5):81.

- [14] Broides A, Bereza O, Lavi-Givon N, Fruchtmann Y, Gazala E, Leibovitz E: Parental acceptability of the watchful waiting approach in pediatric acute otitis media. *World journal of clinical pediatrics* 2016, 5(2):198.
- [15] Bhat V, Bhandary SK, Shenoy V: Otitis media with effusion in relation to socio economic status: a community based study. *Indian Journal of Otolaryngology and Head & Neck Surgery* 2012, 64(1):56-58.
- [16] Bowatte G, Tham R, Allen K, Tan D, Lau M, Dai X, Lodge C: Breastfeeding and childhood acute otitis media: a systematic review and meta-analysis. *Acta Paediatrica* 2015, 104:85-95.
- [17] Lodge CJ, Bowatte G, Matheson MC, Dharmage SC: The role of breastfeeding in childhood otitis media. *Current allergy and asthma reports* 2016, 16(9):68.
- [18] Ajetunmobi OM, Whyte B, Chalmers J, Tappin DM, Wolfson L, Fleming M, MacDonald A, Wood R, Stockton DL: Breastfeeding is associated with reduced childhood hospitalization: evidence from a Scottish Birth Cohort (1997-2009). *The Journal of pediatrics* 2015, 166(3):620-625. e624.
- [19] Ladomenou F, Moschandreas J, Kafatos A, Tselentis Y, Galanakis E: Protective effect of exclusive breastfeeding against infections during infancy: a prospective study. *Archives of disease in childhood* 2010, 95(12):1004-1008.
- [20] Sangeetha P, Prabhawati P, Inamadar P, Yendigeri SM, Rai K, Hegde A: Feeding pattern a dual risk? otitis media (OM) and early childhood caries (ECC). *system* 2014, 3:4.
- [21] Avital A, Donchin M, Springer C, Cohen S, Danino E: Feeding young infants with their head in upright position reduces respiratory and ear morbidity. *Scientific reports* 2018, 8(1):1-7.
- [22] Nadal LF, Rodrigues AH, Costa CD, Godoi VC, Klossowski DG, Fujinaga CI: Investigation of maternal practices of breastfeeding and their relation with the infection of the upper airways and otitis media. *Revista CEFAC*. 2017 Jun;19(3):387-94.



Samia Tul Rasool

Place and date of birth: Gujranwala, Pakistan. 1-1-1197.

Educational background: Final year MBBS, Rawalpindi Medical University Rawalpindi, Pakistan.



Sana Mansoor

Place and date of birth: Sialkot, Pakistan. 14-9-1997

Educational background: Final year MBBS, Rawalpindi Medical University Rawalpindi, Pakistan.



Tayyab Mumtaz Khan

Place and date of birth: Lahore, Pakistan 23-3-1996.

Educational background: Final year MBBS, Rawalpindi Medical University Rawalpindi, Pakistan.