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Original Research Article

Risk Factors of Acute Otitis Media among Infant in Tertiary Care Center: A Cross Sectional Study

Anil Pandey[1], Anupama Pradhan[2], K. Krishna Medha[3], Anshul Singh[4], Ankita Yadav[5]

[1]Assistant Professor, Department of ENT and HNS, Autonomous State Medical College, Firozabad, Uttar Pradesh, India.
[2]Reader, Department of Conservative Dentistry and Endodontics, K.D. Dental College, Mathura, Uttar Pradesh, India
[3]Senior Resident, Department of ENT, AIIMS, Bibinagar, Hyderabad, India.
[4]Senior Resident, Department of ENT and HNS, Autonomous State Medical College, Firozabad, Uttar Pradesh, India.
[5]Resgistrar, Artemis Hospital, Gurugram, Haryana, India.

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Corresponding author: Dr. Anshul Singh
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Abstract

Objectives: Otitis media are well identifying as an infection and/or inflammation of the middle ear. New-born's and infants are more likely to infect with AOM because of the immature immune system. This present study was to evaluate the various risk factors of acute otitis media in infants in tertiary care centre.

Methods: A questionnaire form was prepared by the researchers in order to collect all the relevant data associated with the study sample. The questionnaire form contains of (11) items that are (Age, gender, residency, type of feeding, nasal obstruction condition, child position during feeding, mother's position during feeding, upper respiratory tract infection, using bottle feeding at night, exposed to second hand smoke, and using the pacifiers when sleeping).

Results: Most of the infants 16(40%) of case group were in age 7-9 months. 29(72.5%) bottle feeding infants were seen in case group and 27(67.5%) bottle feeding infants were seen in control group. Nasal obstruction was seen in 30(75%) case and 23(57.5%) control group infants. Child's position during feeding in case group of majorities of cases 27(67.5%) had supine. Child's position during feeding in control group of majorities of cases 22(55%) had semi flower's. Upper respiratory infection was seen in 18(45%) infants of case group and 24(60%) infant of control group. Bottle feeding at night (for breast feeding infants) was seen in 10(83.33%) infants of case group and in 9(75%) infants of control group. Children exposed to passive smoking was seen in 34(85%) infants of case group and 24(60%) infants of control group.

Conclusions: This present study concluded that the bottle feeding, nasal obstruction, supine position during feeding, child exposed to passive smoking are major risk factors for acute otitis media in infants.

Keywords: Infants, Acute otitis media, bottle feeding.

Introduction

Acute otitis media is one of the most widespread communicable diseases occurring during childhood. Prolonged and recurrent attacks of AOM may lead to hearing impairment and late speech development, which will influence the child's later performance at school [1]. The yearly cost of AOM in the United States is an estimated $5 billion [2]. It is an estimated that about 709 million new AOM cases annually worldwide, with greater than half in children less than five years of age [3]. A recurrent and prolonged episode of AOM may lead to many health problems such as hearing impairment, delayed speaking development, and delayed language and educational development[4]. In the United States of America, the annual cost of AOM is approximately 5 billion dollars [5]. Several influences have been identified to be accompanied with the development of AOM, some of these influences are unanimously recognized such as environmental tobacco smoke exposure and adenoids hypertrophy; other influences are more controversial such as gender or poor economic status [6] stated that's the possible risk factors that are associated with otitis media are family history of otitis media, recurrent upper respiratory infections, younger age, and second hand smoking [7]. Other risk factors that are associated with recurrent otitis media among infants are includes orofacial anomalies such as cleft palate, overcrowding, lack of breast feeding or shorter duration of breastfeeding, and prolonged bottle-feeding while lying. Supine-feeding positions, immune deficiencies, and gastro-esophageal reflux are also identified as a risk factors of AOM [8]. Identifying of otitis media risk factors can contribute to improving management and effective prevention plan. Pawathil, and Rajamma (2016) [9] mentioned that are by recognizing the risk factors if AOM, the clinician can notify parents about preventive measures to avoid these factors. This present study was to evaluate the various risk factors of acute otitis media in infants tertiary care centre.

Material & Methods

This study was conducted in the Department of ENT, Autonomous State Medical College, Firozabad, Uttarpradesh, India during a period from January 2021 to December 2021. Attendant of entire subject signed an informed consent approved by institutional ethical committee of Autonomous State Medical College was sought.

A total of 80 infants were enrolled in this study, 40 of them were infected with AOM and the others are not. A questionnaire form was prepared by the researchers in order to collect all the relevant data associated with the study sample. The questionnaire form contains of (11) items that are (Age, gender, residency, type of feeding, nasal obstruction condition, child position during feeding, mother's position during feeding, upper respiratory tract infection, using bottle feeding at night, exposed to second hand smoke, and using the pacifiers when sleeping). Data were collected directly from infant's parents by the researchers through the interviewing technique.

Statistical Analysis

Data was analysed with the help of MS-Office software. All data was tabulated and percentages were calculated.

Observations

A total of 80 infants were categorised into two groups (Case and control). Each group had 40 infants. Most of the infants 16(40%) of case group were in age 7-9 months. Most of the subjects 14(35%) were in age 10-12 months. 26(65%) subjects were females in cases group. 25(62.5%) subjects were males in control group. 23(57.5%) subjects of case group were belonged from urban area. And 22(55%) subjects of control group were belonged from rural areas.

Table 1: Demographic characteristics

Demographic characteristics	Categories	Case	Control
Age	1-3 months	4(10%)	3(7.5%)
	4-6 months	9(22.5%)	13(32.5%)
	7-9 months	16(40%)	10(25%)
	10-12 months	11(27.5%)	14(35%)
	Total	40(100%)	40(100%)
Gender	Male	14(35%)	25(62.5%)
	Female	26(65%)	15(37.5%)
	Total	40(100%)	40(100%)
Residency	Rural	17(42.5%)	22(55%)
	Urban	23(57.5%)	18(45%)
	Total	40(100%)	40(100%)

In this present study, 29(72.5%) bottle feeding infants were seen in case group and 27(67.5%) bottle feeding infants were seen in control group. Nasal obstruction was seen in 30(75%) case and 23(57.5%) control group infants. Child's position during feeding in case group of majorities of cases 27(67.5%) had supine. Child's position during feeding in control group of majorities of cases 22(55%) had semi flower's. Upper respiratory infection was seen in 18(45%) infants of case group and 24(60%) infant of control group. Bottle feeding at night (for breast feeding infants) was seen in 10(83.33%) infants of case group and in 9(75%) infants of control group. Children exposed to passive smoking was seen in 34(85%) infants of case group and 24(60%) infants of control group.

Table 2: Risk factors associated with AOM.

Risk factors	Frequency	Case	Control
Type of feeding	Bottle feeding	29(72.5%	27(67.5%)
	Breast feeding	11(27.5%)	13(32.5%)
	Total	40(100%)	40(100%)
Nasal obstruction	Yes	30(75%)	23(57.5%)
	No	10(25%)	17(42.5%)
	Total	40(100%)	40(100%)
Child's position during feeding	Supine	27(67.5%)	09(22.5%)
	Semi flower's	2(5%)	22(55%)
	Lateral	11(27.5%)	09(22.5%)
	Total	40(100%)	40(100%)
Mother's position in case of bottle feeding	Away from infant	20(64.51%)	6(19.35%)
	Near of infant	11(35.48%)	25(80.65%)
	Total	31(100%)	31(100%)
Upper respiratory infection	Yes	18(45%)	24(60%)
	No	22(55%)	16(40%)
	Total	40(100%)	40(100%)
Using bottle feeding at night (for breast feeding infants)	Yes	10(83.33%)	3(25%)
	No	2(16.67%)	9(75%)
	Total	12(100%)	12(100%)
Children exposed to passive smoking	Yes	34(85%)	16(40%)
	No	6(15%)	24(60%)
	Total	40(100%)	40(100%)

Discussions

Otitis media are well identifying as an infection and/or inflammation of the middle ear [10], it is the second most common childhood disease after upper respiratory tract infection [11]. AOM is the most frequently recognized ear infection [12], and it is one of the most widespread communicable diseases of childhood that is most frequently occurs between 3 months to 3 years of age. Newborns and infants are more likely to infect with AOM because of the immature immune system [13] reported that the AOM is a disease of infancy; it can affect more than 33% of children less than one year of age. Ginkel et al., (2017) [4] mentioned that about 25-36% of children less than one year have experienced at least one event of AOM and approximately 20% of the infants developed more than one event of AOM.

In this present study, a total of 80 infants were included and categorised into two groups (Case and control). Each group had 40 infants. Most of the infants 16(40%) of case group were in age 7-9 months. Most of the infants 14(35%) were in age 10-12 months. 26(65%) subjects were females in cases group. 25(62.5%) subjects were males in control group. 23(57.5%) subjects of case group were belonged from urban area. And 22(55%) subjects of control group were belonged from rural areas.

Jack L et al in USA 1997, found that the males consistently had higher incidence of AOM attacks than females [14]. Serhan N, found otalgia (or excessive crying, head rollings, irritability) was present in (89.2%) of patients, fever in (62.8%), discharge in (37.2%) and vomiting in (29.9%) [15].

Alho O.P et al1991, found that the development of AOM higher in children attend day care centers when compared with care in their homes [16]. In the meta-analysis of Uhari et al in Finland 1996, the risk of AOM also increased with child care outside the home (daycare) [17,18]. Jose F et al (2006), found that one of the mechanisms involved in the association between bottle feeding and OM is "positional OM", according to which children bottle fed in an unsuitable position (lying down) are great risk for AOM, as shown in a cohort with (698) children followed up from birth to two years of age demonstrated that the supine bottle feeding position was associated with earlier onset of AOM [19]. This might be due to aspiration of milk during supine feeding.

In this present study, 29(72.5%) bottle feeding infants were seen in case group and 27(67.5%) bottle feeding infants were seen in control group. Nasal obstruction was seen in 30(75%) case and 23(57.5%) control group infants. Upper respiratory infection was seen in 18(45%) infants of case group and 24(60%) infant of control group. Bottle feeding at night (for breast feeding infants) was seen in 10(83.33%) infants of case group and in 9(75%) infants of control group. Uhari et al, found that the use of a pacifier increase the risk for AOM by (24%) [17]. Warren et al (2001) in his study in USA, demonstrated that pacifier sucking was significantly associated with AOM from the 6th to the 9th months and presented a strong trend towards statistical significant in the period from 9-12 months [20]. This is probably due to eustachian tube dysfunction associated with pacifier sucking.

In this present study, child's position during feeding in case group of majorities of cases 27(67.5%) had supine. Child's position during feeding in control group of majorities of cases 22(55%) had semi flower's. Jack L.et al, found in a study conducted in USA, 1997 a significant protective relationship between breast feeding only during the 1st year of life [14]. A meta-analysis conducted by Uhari et al, concluded that breast feeding in the first 3 months of life reduce the risk of AOM by (13%) [17]. Jose F et al (2006), found that one of the mechanisms involved in the

association between bottle feeding and OM is "positional OM", according to which children bottle fed in an unsuitable position (lying down) are great risk for AOM, as shown in a cohort with (698) children followed up from birth to two years of age demonstrated that the supine bottle-feeding position was associated with earlier onset of AOM [19]. This might be due to aspiration of milk during supine feeding. In this present study, children exposed to passive smoking was seen in 34(85%) infants of case group and 24(60%) infants of control group. Serhan N, reported that children of smoking families had higher incidence of AOM (53.2%) compared to (46.8%) in those of non-smoking families [15, 21]. Uhari et al, found that the parental smoking increased the risk of AOM [17]. On the other hand Jose F.et al (2006), concluded that passive smoking does not increase the chance of non-recurrent AOM, with regard to recurrent AOM, passive smoking was classified as a probable risk factor [19, 22].

Conclusions

This present study concluded that the bottle feeding, nasal obstruction, supine position during feeding, child exposed to passive smoking are major risk factors for acute otitis media in infants.

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