MOLUCCA MEDICA (MM)
JURNAL KEDOKTERAN DAN KESEHATAN
ISSN 1979 – 6358, VOLUME 4, NOMOR 2, MARET 2014

DAFTAR ISI

THE EFFECT OF UPPER RESPIRATORY TRACT INFECTION ON THE INCIDENCE OF ACUTE OTITIS MEDIA IN CHILDREN OF ENT DEPARTMENT OF DR. M. HAULUSSY GENERAL HOSPITAL AMBON

Siti Umi Marhamah Polpoke, Farah Christina Noya, Rodrigo Limmon

Faculty of Medicine Pattimura University
E-mail:

Diterima 15 Juli 2012/Disetujui 24 September 2012

Abstract

Acute otitis media or AOM is one of infectious diseases that commonly occur in childhood. High incidence of AOM in children resulted from a combination of several factors, one of which is upper respiratory tract infection (URTI). Aim: This study was aimed to determine the effect of URTI on the incidence of AOM in children that were treated in department of ENT dr. M. Haulussy general hospital Ambon in 2011 and 2012. Methods: This study was conducted in a cross-sectional approach and designed in a retrospective quantitative method using secondary data. Samples were taken from total population for cases and using random sampling method for control to meet the minimum sample requirements. Subjects were 268 samples consisting of 134 samples of AOM (case) and 134 samples of other ear diseases (control). Data were analyzed using chi-square test to determine the effect of URTI on the incidence of AOM. Result: Chi square test result shows a significant effect of URTI on the incidence of AOM ($p < 0.001$) in which pediatric patients with URTI have a chance of 6.65 times to suffer from AOM (OR = 6,65). Conclusion: There is a significant effect of URTI on the incidence of AOM.

Keywords: URTI, AOM, incidence, risk factor, effect

Abstrak

Otitis media akut atau OMA merupakan salah satu penyakit infeksi yang umumnya terjadi pada masa anak-anak. Insiden yang tinggi dari OMA pada anak merupakan kombinasi beberapa faktor, salah satunya adalah infeksi saluran pernapasan atas (ISPA). *Tujuan:* Penelitian ini bertujuan untuk mengetahui ada tidaknya pengaruh ISPA terhadap kejadian OMA pada pasien anak di klinik THT RSUD dr. M. Haulussy Ambon Tahun 2011 dan 2012. *Metode:* Penelitian ini menggunakan pendekatan *case control* yang bersifat retrospektif dengan menggunakan data sekunder. Pengambilan sampel menggunakan metode *total sampling* untuk sampel kasus dan *random sampling* untuk memenuhi minimal sampel penelitian. Subyek penelitian adalah 268 sampel yang terdiri dari 134 sampel yang merupakan OMA (kasus) dan 134 sampel merupakan penderita penyakit telinga yang lain (kontrol). Analisis data dilakukan dengan uji *chi square* untuk mengetahui pengaruh ISPA terhadap kejadian OMA. *Hasil:* Hasil uji *chi square* menunjukkan bahwa adanya pengaruh yang signifikan dari ISPA terhadap kejadian OMA ($p < 0,001$) dimana pasien anak

yang menderita ISPA mempunyai peluang sebesar 6,65 kali untuk menderita OMA (OR = 6,65). *Kesimpulan:* ISPA memiliki efek yang signifikan terhadap kejadian OMA.

Kata kunci: ISPA, OMA, faktor risiko, pengaruh

INTRODUCTION

Acute Otitis Media (AOM) commonly occurs in children (Klien, 2009). A systematic review in 2012 reports that AOM incidence globally is 10.85% with 709 cases happened per year, in which 51% of cases found in children under 5 years old (Monasta, et al., 2012). In the United State of America (USA), averagely, children under 2 years old experienced minimally one episode of AOM (Gotcsik, 2012). Another study was done in Bangladesh in 2007 found that 36% children contracted AOM in first year of their life and 10% in the second year of their lives where 26% of them experienced a recurrence or relapse AOM (Gotcsik, 2012). Studies by Klien, 2009 and Roy, 2007 concluded that the incidence of AOM increased in age 6–18 months, the lowest incidence is in the first three months of life. In Indonesia, a study was conducted toward 55 children diagnosed with AOM in Medan, 2009 and found that 58,2% of them are under 19 years old (Siew, 2009).

High incidence of AOM and its recurrence in children were resulted from a combination of several factors (Kerschner, 2007) of which dysfunction of Eustachian tube, upper respiratory tract infection (URTI), history of the absence of breastfeeding, male children and very low birth weight (< 1500 g), exposure to cigarette smoke, habitual sleeping position, children in day care and genetic predisposition (Klien, 2009; Kerschner, 2007; Djaafar, 2011). Furthermore, a study by Lok, 2012 determined risk factors that affect incidence of hearing disability caused by AOM and found that there were 4 risk factors that had significant effect ($p < 0,001$), which are children sent to daycare, children with more than 4 siblings, male children, and children with URTI. Upper respiratory tract infection frequently happens in children (Revai, 2007; Morris, 2009) and is able to develop to AOM and sinusitis (Revai, 2007). In average, there are 6–8 children contracted URTI every year (Morris, 2009). A study in the USA in 2007 found that among 112 children (6–35 months old) with URTI, 30% developed to AOM and 8% to sinusitis (Revai, 2007). Another study that was conducted in the USA in 2008, toward 709 children with URTI concluded that children with URTI who had more than 2 variants of nasopharyngeal bacteria had higher risk to develop AOM ($p < 0,001$) (Revai, 2008). In Indonesia, a study by Siew found that 36.4% of 55 patients had history of URTI (Siew, 2009). In Maluku, data regarding the incidence of AOM were unavailable both in Provincial (Maluku) and City (of Ambon) Health Division. In a preliminary study, data were found of outpatient children visiting ENT clinic of Dr. Haulussy General Hospital, a referral hospital in Maluku. The data shows that in children of 1–14 years of age, 88 cases of AOM was found in 2011 and 60 cases from January to April 2012 (4 months). It can be concluded that there is an increased incidence of AOM in dr. Haulussy General Hospital Ambon. Based on those findings, this study was conducted to find out whether there is a significant effect of URTI on the incidence or AOM in children that were treated in the Department of ENT, dr. Haulussy General Hospital, Ambon during the period of year 2011–2012.

METHODS

This study was conducted from June–July 2013, used a case control design with a retrospective approach. Population were all children with AOM treated in the ENT department, dr. Haulussy General Hospital Ambon for case, and all children with other ear diseases treated in the ENT department, dr. Haulussy General Hospital Ambon for control. Minimun sample size was calculated using the formula for case control study resulted a number of 133 samples for case and 133 for control. Samples were restricted to data of children 1–12 years old, traced from patients' medical record from 2011 to 2012 (secondary data). Using total sampling matched to the restriction criteria for case sample, 134 samples were obtained, and randomly 134 samples for control are selected matched to the control restriction criteria. Data were analised using *Chi-Square* test using $\alpha = 0,05$ for the significance of the effect, while *Odds Ratio* (OR) was used to determine the effect size.

RESULTS AND DISCUSSION

Characteristics of study subjects by age groups and sex groups are shown in table 1 and 2. According to the ages of study subjects, more than a half of case samples (58%) were in group of age 1-4 years old and the rest was in group of age 5-12 years old, meanwhile control samples were predominant in group of age 5–12 years old (57.5%). As per the sex group, male children were of highest percentage (56.7% in case and 61.2% in control).

In accordance with the state of URTI, 70.1% of children in case group had history of or were contracting URTI and in control group were only 29.9% of children had history of or were contracting URTI.

Using Chi-square test to analyze the effect of URTI on the incidence of AOM, it was resulted in p value < 0.001 and Odd Ratio (OR) of 6.65 (95% CI: 3,9-11,3).

It can be seen in Table 4.4 that study subjects that were contracted URTI in case is predominant (73,9%), far more than samples in control group that contracted URTI (29,9%). Analysis of data with *chi square* resulted in p < 0,001, means that URTI have significant effect on the incidence of AOM. Odds ratio (OR) = 6,65 (95% CI: 3,9–11,3) means that upper respiratory tract infection was a risk factor of acute otitis media with odd ratio 6.65 (OR=6.65).

These findings are in line with basic theory said that children are highly probable experienced shifting infection from nasal mucosa to middle ear due to their anatomical structure of *Eustachian* tube. The tube is shorter, straighter and more horizontal in children, compare to adults. This condition make easier for infection to progress from nasopharyngeal to Eustachian tube and develop URTI to AOM in children (Klien, 2009; Kerschner, 2007; Djaafar, 2011).

Lok, et al. (2012) found that there are 4 risk factors that significantly affect (p < 0,001) hearing problems due to AOM to happen, of which URTI is one. Another study by Revai, *et al*. (2008) also found the same results that children with URTI, especially who were infected by more than two nasopharyngeal bacterias had higher risks of developing to AOM (p < 0,001). Pettigrew, et al. (2011) in their study found that URTI caused by an interaction of virus and bacteria contributed higher risk for the development of AOM (p < 0,05). In Indonesia, there was a lack of published studies about the effect of URTI on the incidence of AOM. However, a study by Siew in Medan (2009) descriptively reported that 36.4% of 55 patients with AOM had history of URTI just before the development of AOM.

CONCLUSSION

It can be concluded from this study that there is a significant effect of upper respiratory tract infection on the incidence of acute otitis media in children. In this study, upper respiratory tract infection was a risk factor of acute otitis media with odd ratio 6.65 (OR=6.65).

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