

# Acute Otitis Media Incidence Amongst Population Older Than 3 Years of Age in Hakkari City

## Hakkari İlinde Yaşayan Üç Yaş Üstü Popülasyondaki Akut Otitis Media İnsidansı

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### ABSTRACT

**Objective:** Acute Otitis Media (AOM) is a frequently seen infectious disease encountered by the otorhinolaryngologists in their outpatient clinics. In this study, we intended to review of the potential risk factors by considering AOM incidence amongst population older than 3 years, living in Hakkari city.

**Material and Methods:** We determined the number of AOM patients applied to Hakkari State Hospital Ear Nose Throat (ENT) department between the April 2015 and June 2015, who were older than 3 years of age, and had no other underlying pathologies.

**Results:** AOM was diagnosed in 37 of 1150 patients (3.3%) who applied to ENT department. This ratio was higher than common AOM incidence in patients older than 3 years in the literature (0.2-0.4%). It was supposed that the factors which possibly caused this high ratio might be genetic factors, excessive air pollution, spring season conditions, crowded and insanitary living spaces.

**Conclusion:** AOM is an important social health problem, and although it is frequently observed in children, it may be observed in adults in case of poor hygiene conditions, excessive air pollution and low- socio-economic level. In addition, genetic factors may also be risk factor for the disease.

### Keywords

*Acute otitis media; epidemiology; etiology; incidence; community health*

### ÖZET

**Amaç:** Akut Otitis Media(AOM) sıklıkla Kulak Burun boğaz hekimlerinin poliklinik uygulamalarında karşılaştığı oldukça yaygın görülen bir enfeksiyon hastalığıdır.. Bu çalışmada Hakkari’de yaşayan üç yaşından büyük popülasyondaki AOM insidansı saptanarak, olası risk faktörlerinin gözden geçirilmesi amaçlandı.

**Gereç ve Yöntemler:** Bu çalışma; Nisan 2015-Haziran 2015 tarihleri arasında Hakkari Devlet Hastanesi Kulak Burun Boğaz Bölümü’ne başvuru yapan ve sonrasında AOM saptanan, 3 yaşının üzerinde ve alta yatan başka bir patolojisi olmayan hastalar saptanarak gerçekleştirildi.

**Bulgular:** Kulak Burun Boğaz Bölümü’ ne yapılan 1150 başvurudan 37’ sinde AOM saptandı (%3,3). Bu oran literatürde 3 yaşın üzerindeki hastalarda daha önce saptanmış olan AOM insidansından oldukça yüksekti (%0,2-0,4). Bu durum incelendiğinde; genetik faktörlerin, aşırı hava kirliliğinin, ilkbahar mevsim koşullarının, kalabalık ve sağlıksız yaşam alanlarının yüksek AOM insidans oranlarına neden olabileceği düşünüldü.

**Sonuç:** AOM önemli bir halk sağlığı sorunudur ve sıklıkla çocukluk yaş grubunda görülmesine karşın, aşırı hava kirliliğinin çok olduğu bölgelerde, düşük hijyen koşullarında ve düşük sosyokültürel seviyelerde yaşayan erişkinlerde de görülebilir. Buna ek olarak, genetik faktörlerde bu hastalık için önemli bir risk faktörü olabilir.

### Anahtar Sözcükler

*Akut otitis media; epidemiyoloji; etyoloji, insidans; toplum sağlığı*

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## INTRODUCTION

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Acute otitis media is the bacterial inflammation of middle ear space, it usually follows upper respiratory infections, and is frequently observed in children who are younger than 3 years of age.<sup>1</sup>

It is diagnosed by determining hyperemia and bulging on eardrum, and fluid in tympanic space on physical examination in the patients who apply with complaints of earache, hearing loss and aural fullness.<sup>2</sup> Patients' complaints can include fever and fatigue. Type B tympanogram and pneumatic otoscopy findings are helpful to confirm the diagnosis.<sup>3</sup> Nasopharyngeal disorders are needed to be excluded if this clinical condition is recurrently and unilaterally seen in adults. Antibiotics are administered for 10 to 14 days, and this treatment usually cures almost all patients.<sup>4</sup>

AOM particularly occurs in childhood more frequently, and it is mostly seen in 6-18-month-old children. Ninety percent of the children who are younger than 2 years of age have had AOM at least once.<sup>5,6</sup> AOM is observed in males more frequently.<sup>7</sup>

Hakkari is a small city in Turkey, which is located in the Eastern part of the country. Its population is about 80,000 and the big majority of population is ethnically Kurdish. The city is surrounded by high mountains, it is located in a deep-set between all those mountains, and coal is mainly used for heating systems. Therefore, excessive air pollution is a big social health problem in Hakkari.

The aim of this study is to investigate possible etiologic factors, and to determine AOM incidence in Kurdish patients older than 3 years in Hakkari city, by determining the patients who had complaints and physical examination findings of AOM.

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## MATERIAL AND METHODS

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This study was approved by Hakkari State Hospital Ethics Committee with decision number 90549914/1804. All patients provided their verbal informed consents. In this study, it has been presented the AOM incidence amongst older than 3 years old patients living at Hakkari city by selecting from all patients who applied Hakkari State Hospital ENT department between the dates of April 2015-June 2015.

All patients diagnosed with AOM had complaints including earache, aural fullness and hearing loss. Hyperemia, excessive vascularity and bulging of eardrum

were determined of otoscopic examination. Diagnosis was confirmed by tympanometric and pneumatic otoscopy findings. Only the patients older than 3 years have participated in this study due to high rate of AOM incidence in patients younger than 3 years.

All patients were examined with nasal endoscopy for nasopharyngeal pathologies. Any other significant underlying pathologies like excessive adenoid vegetation, nasal septum deviation or acute sinusitis were not determined in any of the patients. None of those patients had comorbid systemic diseases. Other possible risk factors of acute otitis media were investigated: its not common to use feeding bottles for babies in this city, and socioeconomic status is poor at this region. Smoking status was not questioned in this study since all of the patients were under 18 years old.

Amoxicillin-clavulonic acid was administered for 10-14 days. Nasal decongestants were given for 5 days. All AOM patients were called for a follow up visit at the end of the two weeks of treatment.

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## RESULTS

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A total of 1150 patients visited Hakkari State Hospital ENT department between April 2015 and June 2015. Thirty-seven patients were diagnosed with AOM, hence the AOM incidence at this city was determined as 3.3% (37/1150) amongst patients older than 3 years of age. All those 37 patients were older than 3 years of age, and all of them admitted with complaints of earache, aural fullness and hearing loss. All patients had hyperemia, hypervascularity and bulging of eardrum, and they were diagnosed with AOM.

The youngest patient diagnosed with AOM was 4 years old, and the oldest one was 57 years old. There were 21 males (56.6%), and 16 females (43.4%), and 13 of them had AOM in both ears (35.1%). Thirteen patients had AOM in their left ears only (35.1%), and the remaining 11 patients had it only in their right ears (29.8%) (Table 1). After amoxicillin-clavulonic acid treatment for 10-14 days, and nasal decongestant for 5 days, it was observed that all patients were cured completely, without any complications.

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## DISCUSSION

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Acute otitis media is a social health problem. It is usually seen in early childhood and infancy, and the in-

**Table 1.** Demographic characteristics of acute otitis media patients, and diagnosed ear sides.

Patient No	Name	Age	Sex	AOM diagnosed ear
1	YHK	6 Y	F	Bilateral
2	MB	4 Y	M	Bilateral
3	NB	16 Y	F	Bilateral
4	AK	9 Y	M	Bilateral
5	İÖ	24 Y	M	Right
6	TT	13 Y	F	Bilateral
7	HK	7 Y	M	Right
8	NT	10 Y	F	Right
9	HÖ	18 Y	F	Left
10	VE	13 Y	M	Right
11	AT	15 Y	F	Right
12	ET	15 Y	M	Left
13	ND	36 Y	F	Left
14	AA	18 Y	M	Left
15	FY	32 Y	M	Right
16	HK	34 Y	M	Right
17	AY	14 Y	F	Right
18	LK	20 Y	F	Left
19	SY	14 Y	F	Left
20	NA	18 Y	F	Left
21	EE	4Y	M	Left
22	AİD	7Y	M	Right
23	DÖ	24 Y	F	Bilateral
24	ŞT	29 Y	F	Bilateral
25	AE	57 Y	M	Left
26	MA	33 Y	M	Bilateral
27	AT	6 Y	M	Bilateral
28	MÖ	35 Y	M	Bilateral
29	MMO	6 Y	M	Bilateral
30	AK	7 Y	M	Left
31	EG	34 Y	M	Right
32	SD	26 Y	F	Left
33	RY	48 Y	M	Right
34	ES	5 Y	F	Bilateral
35	YY	4 Y	M	Bilateral
36	MA	10 Y	M	Left
37	NK	15 Y	F	Left

Y: Years old, F: Female, M: Male.

cidence in the ones younger than 3 years of age may be as high as 50-80%.<sup>5</sup> It is rarely observed in adults. For example, some articles reported its frequency in adults between 0.2-0.4%.<sup>8</sup> Once it is diagnosed in an adult, underlying conditions must be searched for.

In this study, we determined AOM in 37 of 1150 patients, and this ratio is much higher than the rate mentioned in other studies (3.3%). Although it can be thought that this ratio on that study is high because that

study was carried out in spring when allergic and upper airway infections are observed more often, it is still not enough to explain that much big difference ratios with other studies at literature alone. On the other hand, it is expected that AOM incidence should decrease after winter season, but because of the climate in Hakkari, weather is cold and rainy until May or June which is different from other regions of Turkey due to Hakkari's special geographical location.

As known, tympanic space mucosa is fed by atmospheric airflow with diffusion, and this is why its clear that acute otitis media incidence increases when there is obstruction in diffusion.<sup>9,10</sup> Hakkari is a small city with excessive air pollution. The city is surrounded by high mountains, and it is located in a deep-set among all those mountains. Therefore, pollution from heating systems of houses and residual airflow from cars and motorbikes accumulate in the living areas. It was reported at 'Hakkari İli Çevre Durum Raporu' by The Ministry of Environment and Urban Planning of Turkish Republic, that air pollution ratio in Hakkari is significantly higher than the world average.<sup>11</sup> Clearly, high air pollution ratio is a very important factor of elevated AOM incidence in this area by breaking down the diffusion of tympanic space mucosa.

Other essential risk factors for acute otitis media can be identified as anti-hygienic and crowded living spaces.<sup>12</sup> Therefore when all those factors are taken together, it is not be surprising to determine that kind of high acute otitis media incidence at Hakkari.

Besides all those enviromental factors, genetic factors can also play essential roles in etiology. Majority of the patients in this study were ethnically Kurdish, and this may indicate genetic origin of the disease.

The main limitation of this study is that the study was carried on spring. It could be more appropriate to make that kind of incidence studies during the whole year, so seasonal differences could be minimalized. It would also be good to obtain aspirates from the middle ears, and make cultures. It could be helpful to determine bacteriological etiology to decide treatment options. Un-

fortunately, another limitation for this study is absence of cultural studies due to the lack of equipment in Hakkari. Therefore, Further studies are needed.

Although culture studies could not have been done in this study, it has been known that *Streptococcus pneumoniae* (40-50%), *Haemophilus influenzae* (20-30%) and *Moraxella catarrhalis* (10-15%) were determined as the most common bacteriological agents in previous studies.<sup>13-15</sup> AOM mostly improves spontaneously, but in order to avoid complications antibiotic use is recommended.<sup>16</sup> Therefore, all patients were treated with amoxicillin-clavulonic acid, which was described as a good option for AOM treatment.<sup>17</sup> All patients improved completely, without any complications after 10-14 days treatment.

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## CONCLUSION

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In this study AOM incidence amongst older than 3 years of age population in Hakkari city was determined as 3.3%, and it was significantly higher than the average of AOM incidence described in the literature previously (0.2-0.4%). It has been supposed that excessive air pollution in this area, season conditions when the study was performed, anti-hygienic and crowded living spaces are responsible for those results. In addition, genetic factors can be influential with that high rate. Since small number of incidence studies were carried on in this region, it would be necessary and useful to perform more incidence studies with bigger sample sizes, and longer follow-up periods to elucidate etiological conditions more objectively, and to obtain optimum results about incidence in future studies.

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