

Acute Otitis Media in Children Aged 0 - 5 Years, Epidemiological Aspects and Management in the Paediatrics Department of the Hospital National Ignace Deen (Conakry)

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Abstract

Introduction: Acute otitis media is an acute inflammation of the mucosa of the middle ear cavities. It is often secondary to nasopharyngitis, which favors the passage of infection through the Eustachian tube to the middle ear. The aim of our study was to improve the management of AOM in the Paediatric Department of the Hospital National Ignace Deen (Conakry). **Patients and Methods:** This was a prospective descriptive study lasting 6 months from 01 July to 31 December 2011; the study covered 525 cases out of a total of 6276 children, *i.e.* a frequency of 8.36%. **Results:** The most affected age group was 6 to 11 months. Males predominated (69.71%). 82.29% had a history of recurrent rhinopharyngitis. The most frequent reason for consultation was incessant crying (66.29%). Rhinopharyngitis and malaria were the most commonly associated pathologies (87.62% and 39.62% respectively). 72.19% of our patients were admitted with congestive AOM and received medical treatment. We recorded one case of otomastoiditis which was treated surgically. **Conclusion:** AOM is more common in children aged between 6 and 24 months. Good collaboration between paediatricians and ENT specialists is essential to reduce the morbidity of AOM.

Keywords

Acute Otitis Media (AOM), Treatment, Nasopharyngitis, Eustachian Tube

1. Introduction

Acute otitis media (AOM) is defined as inflammation of the middle ear (eardrum,

ossicles, tympanic cavity, mastoid and Eustachian tube) lasting less than three weeks, generally caused by viruses or bacteria [1].

AOM is very common, and 75% of children suffer from at least one AOM before they reach school age [2]; it is the second most common reason for paediatric consultations [3]. It is a public health problem, as it is one of the most frequent reasons for consulting the Ear, Nose and Throat (ENT) Department; it is very common in infants aged between 6 and 24 months, with predisposing factors including nasopharyngitis, gastro-oesophageal reflux, allergy, enlarged adenoids and others [4].

It generally occurs in conjunction with a viral infection of the upper respiratory tract, and more often in winter. The short, gaping, more horizontal eustachian tubes of infants make them more susceptible to AOM, which explains its peak frequency between the ages of 6 and 24 months. Attendance at nurseries and passive smoking also encourage viral infections and, consequently, AOM. Other risk factors include craniofacial anomalies (such as cleft palate), trisomy 21, adenoid hypertrophy, immune deficiency, dummy use, short breastfeeding periods and prolonged use of the bottle in the supine position [5] [6].

Worldwide, the estimated incidence is 709 million cases each year, half of which occur in children under 5 [4]. In 1989, in Nigeria, a 2009 study of the epidemiology of otitis media in 600 children aged 0 - 12 years by Amusa *et al.* revealed a prevalence of AOM of 11.8% [4]. In Cameroon, few articles have been published on acute otitis media. Nevertheless, in 2009, he found a prevalence of otitis in general of 13.06% among the main ENT conditions [7].

AOM is diagnosed clinically, based on a rigorous otoscopic examination [8]. It is the cornerstone of treatment, but it is often very difficult to diagnose clinically [9]. AOM is often a bacterial infection (80% - 95% of cases) of the middle ear cavities. The main bacteria causing AOM are *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moxarella catarrhalis* and, to a lesser extent, *Streptococcus pyogenes*. *Mycoplasma pneumoniae* is rarely implicated [10].

Acute otitis media (AOM) is the number one reason for antibiotic prescriptions in children in developed countries. Acute otitis media (AOM) is one reason for antibiotic prescriptions in children in developed countries [11]. The high rate of AOM in paediatric consultations, the danger of complications and their neurological consequences motivated us to carry out this work and to improve the treatment of AOM in the paediatric department. The aim was to add value to our scientific research.

2. Materials and Methods

This was a prospective descriptive study lasting 6 months, from 01 July to 31 December 2011, conducted in the paediatrics department of the IGNACE DEEN National Hospital of Conakry University Hospital located in the Kaloum peninsula in the Kouléwondy district. We collected 525 cases of AOM during this period. All children aged between 0 and 5 years who were diagnosed with AOM

using an otoscope and who received paediatric care during the study period were included in the study. Children with ear pathologies other than AOM were not included in our study.

For data collection, we used the following media:

- Consultation registers;
- The individual patient monitoring log;
- A pre-established individual survey sheet.

We carried out an exhaustive recruitment of all AOM cases during the study period.

The following variables were collected (see **Appendices**): epidemiological (frequency, age, sex, origin, month, parental education level, history of otitis), clinical (reasons for consultation, physical examination, associated pathologies encountered during the study), therapeutic (medical and surgical treatment). The filling of the forms was manual and was done using the data collected on the survey form established for this purpose. Our results were presented in the form of discussed figures and tables, compared to data from the literature. Our text, tables and figures were entered using Microsoft Word 2007, EXCEL 2016, PowerPoint and Epi info 3.5.1 software.

Limitations and difficulties include a lack of equipment (consultation microscope, tympanometry), failure by patients' parents to keep appointments and their socio-economic situation.

Ethics: Above all, we obtained the parents' consent and reassured them that medical ethics would be respected.

3. Results

Among 6276 patients consulted during our study period, 525 had AOM, representing a frequency of 8.36%. **Table 1** shows the frequency of AOM during the study period.

The age group between 7 and 11 months was the most affected, accounting for 36.19% of patients (**Table 2**). Boys predominated, accounting for 69.71% of cases, with a sex ratio of 2.30 (**Figure 1**). Rhinopharyngitis was the most common antecedent among children (82.29%) (**Table 3**). There were more consultations in the paediatric department in August, accounting for 26.48% of cases (**Figure 2**).

The most common reason for consultation was incessant crying in 348 cases (**Table 4**). According to otoscopy, the eardrum was congestive in 379 cases, *i.e.* 72.19% (**Table 5**). Nasopharyngitis was associated with AOM in 87.62% of children (**Table 6**).

Treatment was based on otoscopic data and the complications encountered.

- 379 patients (72.19%) came to the clinic at the stage of AOM with congestive eardrum, and received treatment based on nasopharyngeal obstruction (hypertonic seawater solution), analgesics/antipyretics (Efferalgan-Doliprane), ear drops (quinolones) and antihistamines (Desloratadine).

Table 1. Frequency of AOM from 01 July to 31 December 2011 compared with other diseases.

Pathologies	Number of cases	Percentage
Malaria	3134	49.93
Rhinopharyngitis	1128	17.98
AOM	525	8.36
Diarrhoeal diseases	504	8.03
Bronchopneumonia	499	7.96
Malnutrition	380	6.05
Other*	106	1.69
Total	6276	100

*Other: Meningitis, salmonellosis, HIV, tonsillitis.

Table 2. Breakdown of patients by age.

Age range	Number of cases	Percentage %
0 - 28 days	32	6.10
1 month - 6 months	73	13.90
7 months - 11 months	190	36.19
12 months - 36 months	155	29.52
37 months - 60 months	75	14.29
Total	525	100

Table 3. Breakdown of patients by history.

History	Number of cases	Percentage %
Rhinopharyngitis	432	82.29
Recurrent otitis	63	12
Other*	30	5.71
Total	525	100

*Other: Tonsillitis, malaria, digestive disorders.

Table 4. Frequency of consultations for AOM in children aged 0 - 5 years.

Reason for consultation	Number	Percentage %
Incessant crying	348	66.29
Fever	316	60.19
Earache	177	33.71
Rhinorrhea	118	22.48
Diarrhoea	22	4.19
Vomiting	36	6.86
Otorrhea	2	0.38

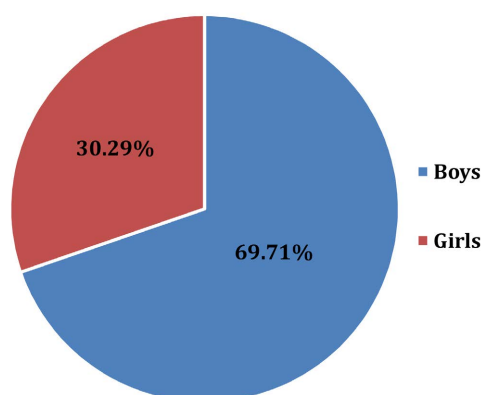


Figure 1. Breakdown of patients by gender (Sex ratio: 2.30 boys/girls).

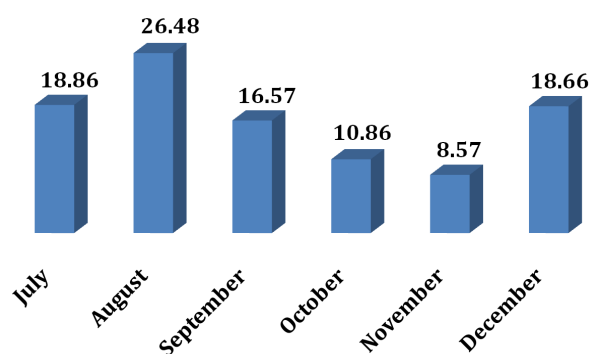


Figure 2. Breakdown of patients by month.

Table 5. Breakdown of patients by otoscopic appearance of the eardrum.

Eardrum	Number of cases	Percentage%
Congestive	379	72.19
Bulging	144	27.43
Perforated	2	0.38
Total	525	100

Table 6. Breakdown of patients according to associated pathologies.

Associated pathologies	Number	Percentage %
Rhinopharyngitis	460	87.62
Acute malaria	208	39.62
Diarrhoeal diseases	102	19.43
Bronchopneumonia	89	17.03
Tonsillitis	5	0.95

- 144 (27.43%) of our patients were consulted at the stage of AOM with a bulging eardrum. Antibiotic therapy (Amoxi-clavulanic acid) was added to the previous treatment regimen.

- 1 (0.19%) child was diagnosed with a perforated eardrum and received antibiotic therapy (cephalosporins) and ear drops (quinolones).
- 1 (0.19%) child was brought for consultation at the stage of otomastoiditis (**Figure 3**), and was referred to an ENT department from where surgical treatment (intro mastoidectomy) and antibiotic coverage (3rd generation cephalosporins) were carried out by the ENT surgeon (**Figure 4**).

Monitoring of our patients was essentially based on clinical criteria. The evolution was favourable with regression of symptoms in 524 patients, *i.e.* 99.81% of cases, with a variable average response time to treatment. One patient with tympanic perforation did not undergo tympanoplasty.



Figure 3. Image of right mastoiditis in a 3-year-old child prior to surgical treatment (13/08/2011).



Figure 4. Seventh day post antro mastoidectomy.

4. Discussion

We recorded a total of 6276 patients, 525 of whom had AOM, *i.e.* a frequency of 8.36%. This result is significantly higher than that found by Njifou Njimah A *et al.* [4] in 2018 in Douala, who reported a frequency of 5.20% of AOM and represented 13% of diseases in children in Abidjan [8]. According to Bonfils [8], it is the 2nd most common infectious disease in children after rhinopharyngitis. Worldwide, the estimated incidence of AOM is 11% [12] (709 million cases each year). This is due to children being referred to paediatrics by their parents, for whatever reason.

We recorded an average age of 20 months during our study. Children aged between 7 and 11 months were the most affected, with a frequency of 36.19%; these results are comparable to those found by Roubal M *et al.* [13] in Morocco and Fontanel JM *et al.* [14] in France. The peak incidence of AOM was between 7 and 12 months and 6 and 18 months, with frequencies of 29.7% and 27.22% respectively.

These data largely demonstrate the fragility of the anatomical structure of the middle ear (the Eustachian tube is shorter, gaping and less functional) and the outbreak of adaptation diseases that are obligatory in this age group.

Out of a total of 525 cases of AOM, males were the most affected: 366 cases, or 69.71%, with a sex ratio of 2.30. This male predominance was observed in previous studies carried out in Abidjan by Ette-Akre. E. E *et al.* [15], which showed that 52.5% of patients were male compared with 47.5% female, with a sex ratio of 1.10.

During our study period, we recorded 26.48% AOM in August, 18.86% in July, 16.57% in September and 18.66% in December, confirming that ENT pathologies in children are frequent in the rainy season and during the harmattan. This is due to the high incidence of upper respiratory tract viruses during these periods. A study carried out in 2004 at the Timone Children's Hospital by R. Nicollas *et al.* [14] showed a higher frequency of AOM in children in winter.

In our study, a history of rhinopharyngitis (82.29%) and recurrent otitis (12%) were the most common.

Cohen R. [16], in a study of the upper respiratory tract in children in 2007, points out that AOM occurs after or during a viral infection of the upper respiratory tract.

AOM is one of the most common complications of nasopharyngitis. This is easily explained by the anatomical proximity of the cavum and the tympanic cavity in young children, which favors the flow of nasopharyngeal secretions towards the middle ear.

Incessant crying was the reason for consultation, with a frequency of 66.29%. On the other hand, Njifou Njimah *et al.* [4] in 2018 in Daoula found 93.3% otalgia followed by otorrhea (70.8%) and then fever (42.5%).

This difference can be explained by the fact that our sample concerned children aged 0 to 5 years, unlike that of Njifou Njimah *et al.*, who included all patients seen for consultation in the ENT departments of these hospitals, who have

the right to complain.

Otoscopy is the key examination for the diagnosis of AOM. All our patients underwent systematic otoscopy. However, the notion of left or right otitis was not taken into account. It has been found that in infants, otitis is bilateral in 40% of cases [17]. As otoscopic forms, more than half of the population studied (72.19%) presented with congestive otitis media, and 27.43% of children had otitis media.

The degree of certainty in diagnosing AOM increases with the age of the child, rising from 58% for children under one year of age to 73% for children over two and a half years of age [18]. These results clearly illustrate the difficulty of diagnosis, which also depends on the experience of the examiner, the otoscopy equipment used and the examination conditions (presence or absence of earwax, for example).

During our study, nasopharyngitis was encountered in 87.62% of our patients. Furthermore, infants are exposed to many infectious episodes of the nasopharynx, particularly of viral origin. These viral attacks are responsible for an alteration in the ciliary movement of the tubal mucosa, which facilitates the spread of infection [3]. This can be explained by the close relationship between the nasopharynx and the middle ear.

Current antibiotic prescribing practices for AOM vary from country to country. The choice of antibiotic therapy is guided by up-to-date epidemiological data, analysis of failures and clinical trials.

Therapeutic treatment was based on otoscopic data and the complications encountered.

AOM often resolves spontaneously, despite its bacterial origin. Previous studies have shown spontaneous resolution of symptoms in 90%, 50% and 20% of cases of AOM caused by *M. catarrhalis*, *H. influenzae* and *S. pneumoniae* respectively. More recent studies have used more rigorous diagnostic criteria for AOM. These studies show that antibiotics are more effective than before, although 50% of untreated children still progress favourably [2].

Paracentesis remained an exceptional procedure; no case was observed in our context, in contrast, in Europe where it is systematic [4]. We noted 1 case of complications such as acute mastoiditis (0.19%), which is identical to the study by Asse [8] in Côte d'Ivoire of 35 AOM in children aged 0 to 14 years, who noted 1 case of mastoiditis. The overall outcome was favourable. Lack of equipment (consultation microscope, tympanometry, etc.), non-compliance with appointments by patients' parents and their socio-economic situation remain the limits of this study, because the authorities must equip the pediatric and ENT services and adapt their reception capacity to the needs of the population; ensure good initial and continuing training for health personnel at all levels; in addition to encouraging specialization in ENT and pediatrics.

5. Conclusions

Acute otitis media plays an important role in paediatric practice at the HNID-CHU in Conakry. It is responsible for major morbidity and has a significant so-

cio-economic impact, particularly as it affects preschool children. The resulting clinical picture is a real medical and social concern.

To reduce the morbidity of AOM, it is essential to organise hospital treatment, ensure good collaboration between paediatricians and ENT specialists, provide access to essential medicines, equip hospital departments and provide ongoing training for staff. Raising awareness remains the key to prevention.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendices

Acute otitis media in children aged 0 - 5 years, epidemiological aspects and management in the Paediatrics Department of the Hospital National Ignace Deen (Conakry)

INVESTIGATION SHEET N°

GENERAL INFORMATION:

DATE OF CONSULTATION.../.../.....

NAME

FIRST NAMES

AGE

SEX

WEIGHT (kg)

FATHER'S FIRST NAME

OCCUPATION

NAME AND FIRST NAMES OF THE MOTHER

OCCUPATION

ADDRESS

NEIGHBORHOOD

PREFECTURE

TEL: landline..... cell:.....

BACKGROUND: O R L

OTOLOGICAL YES NO

RHINOPHARYNGE YES NO

OTHERS

CLINIC:

SYMPTOMATOLOGY:

OTALGIA YES NO

OTORRHEA YES NO

INCESSANT CRYING YES NO

RHINORRHEA YES NO

TIGHTENER YES NO

MUCOPURULENT YES NO

FEVER YES NO

DIGESTIVE SIGNS YES NO

DIAGNOSTIC:

OTOSCOPY YES NO

CONGESTIVE AOM YES NO

HYPERVASCULARIZED TYMPANI YES NO

DISAPPEARANCE OF THE TRIANGLE YES NO

POLITZER LIGHT

OMA COLLECTED YES NO

ROUNDED CHERRY RED EARDRUM YES NO

DISAPPEARANCE OF OSCICULAR RELIEF YES NO

PERFORATED OMA YES NO

PURULENT OTORRHEA YES NO

TYMPANIC PERFORATION YES NO

POSTERO-INFERIOR

TREATMENT:

MEDICAL: YES NO

NSAIDs YES NO

ANTALGIUM/ANTIPYRETIC YES NO

NASAL DROPS YES NO

EAR DROPS YES NO

ANTIHISTAMINES YES NO

C3G YES NO

C1G/C2G YES NO

AMOXIC-CLAVULINIC ACID YES NO

MACROLIDE YES NO

SURGERY YES NO

EVOLUTION:

FAVORABLE YES NO

UNFAVORABLE YES NO

COMPLICATION YES NO

OTOMASTOIDS YES NO

TYMPANIC PERFORATION YES NO

OTHERS.....