



Simple chronic suppurative otitis media: Epidemiological, clinical, bacteriological and therapeutic aspects at the Sylvanus Olympio University hospital in Lomé

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Abstract

Objective: To describe the epidemiological, clinical, bacteriological and therapeutic aspects of simple chronic suppurative otitis media at the Sylvanus Olympio CHU.

Materials and Methods: This was an 08-year descriptive retrospective study (January 1, 2010 to December 31, 2017) carried out in the ENT department of the Sylvanus Olympio University Hospital in Lomé, covering the files of patients in whom the diagnosis of simple chronic suppurative otitis media was selected.

Results: 109 cases of simple chronic suppurative otitis media met the study criteria. They represented 0.16% of ENT consultations and 0.46% of otological pathologies. The sex ratio was 0.94. The mean age of the patients was 28.64 years with extremes of 08 months and 80 years. The most frequent reason for consultation was purulent otorrhea (80.73%). Ooscopic examination revealed non-marginal perforation of the tympanic membrane in 97.26% of cases. Cytobacteriological examination had been performed in 53.21% of cases and the most frequently isolated germs were *Pseudomonas aeruginosa* (50.80%), *Staphylococcus aureus* (14.29%), *Klebsiella pneumoniae* (12.69%) and *Proteus mirabilis* (11.11%). *Pseudomonas aeruginosa* was sensitive to imipenem and ciprofloxacin in 96.66% and 85.71% of cases, respectively, while *Staphylococcus aureus* was sensitive to imipenem, ciprofloxacin, and amoxicillin-clavulanic acid in 100%, 67%, and 78% of cases, respectively. The outcome was favorable in 105 cases (96.33%).

Conclusion: Simple chronic suppurative otitis media is relatively infrequent in our setting. Monitoring of the bacterial ecology of this condition must be regular because it allows to know the frequent germs for a rational probabilistic treatment.

Keywords: Otitis, chronic suppurative otitis media, *pseudomonas aeruginosa*, *staphylococcus aureus*

Introduction

Chronic otitis media (COM) refers to any inflammatory process in the cavities of the middle ear that has been evolving for more than 3 months and is accompanied either by effusion behind an intact tympanic membrane but without acute symptoms, or by otorrhea through a perforation tympanic membrane ^[1]. This definition, which was formulated in 1987 at the Fourth International Symposium on Otitis Media, seems to be the most consensual, but remains global and imprecise because it does not take into account the evolving and sequelae forms. Simple chronic suppurative otitis media (SCSOM) is an ear condition characterized by persistent or recurrent purulent otorrhea of the middle ear through a perforated tympanic membrane. General practitioners are usually the first to see these patients in consultation and rely mainly on probabilistic antibiotic therapy ^[2]. Due to its recurrent nature and the emergence of resistant pathogens, infection control poses a major therapeutic challenge. The problem of antibiotic resistance is aggravated by self-medication ^[2]. Nowadays, it is rare for an otolaryngologist to encounter the bacterial flora of an ear with SCSOM that has not yet been altered by previous antibiotic treatment; in some cases, the cultures are sterile ^[3]. Knowledge of the local bacterial ecology in SCSOM is

essential to initiate probabilistic treatment pending culture results, which makes it mandatory for periodic monitoring of the microbiological

Profile and susceptibility profile in SCSOM. No study has yet been conducted on SCSOM in Togo. This is why we have set ourselves the general objective of studying the bacterial ecology of suppurative COMs in patients seen in consultation at the Sylvanus Olympio University Hospital Center (CHU-SO). More specifically, it was a question of listing SCSOM cases, describing their epidemiological and clinical characteristics, identifying the main responsible germs, determining the sensitivity of the strains isolated to the antibiotics tested and presenting our treatment.

Materials and Methods Frame

Our study took place in the ENT department of the CHUSO in Lomé. This referral center is one of the main treatment centers for SCSOM in Lomé. The CHU-SO is the reference university hospital center in Togo. Ear pus samples for cytobacteriological examination if necessary, are carried out during consultations in a sterile way by swabbing (one or two swabs). These samples are taken by the doctors or nurses and are immediately sent to the CHUSO laboratory.

Study material

The study looked at the files of patients who consulted in the ENT department, in whom the diagnosis of SCSOM was made.

Type and period of study

This was a descriptive retrospective study on the analysis of the files of patients who consulted in the ENT department of the CHU-SO from January 1, 2010 to December 31, 2017.

Selection criteria

All the patients who consulted in the ENT department and whose diagnosis of SCSOM or open mucosal otitis was included during the study period. Other forms of COM (otitis media, adhesive otitis, pre-cholesteatomatous states, cholesteatomatous otitis and sequelae of COM) were not included in our study.

Study parameters

The parameters studied in the files concerned: age, sex, history of ENT, medical and surgical history, reasons for consultation, affected side, Condition of the tympanic membrane, germs found on Cytobacteriological examination, the antibiotic sensitivity profile of the bacteria isolated and the treatment administered.

Data analysis

Data collection was carried out using a pre-established survey sheet from the consultation files and the consultation register. We did the manual processing of the survey forms. The information has been collected and recorded. EPI info 3.1 software was used for data processing. The results were formatted with Excel 2016 software.

Results Epidemiological aspects

A total of 68,125 patients had consulted in the ENT department during our study period, including 23,696 patients for otological conditions, or 34.78% of all consultations during our study period. We recorded 204 cases of COM taken as a whole, or 0.29% of all visits during our study period. SCSOM with 109 cases represented 0.16% of all pathologies recorded in the ENT department, 0.46% of otological pathologies and 53.43% of all COM during our study period. The annual frequency of SCSOM was 13.62 cases on average per year. The average age was 28.64 years with extremes of 8 months and 80 years. We had 42 children between 0 and 18 years old, or 38.53% of cases. Table 1 shows the distribution of cases by age.

Table 1: Distribution of patients by age group (in years)

	Number of cases	Percentage
[0 - 10]	29	26.61
[10 - 20]	15	13.77
] 20 - 30]	20	18.35

Table 2: Distribution of the results of the cytobacteriological examinations according to the organisms isolated

1. Germ	Number	Percentage
Gram negative bacilli non-fermentative (n=35)	<i>Pseudomonas aeruginosa</i>	32 50.80
	<i>Acinetobacter</i>	03 4.76
Enterobacteriaceae (n=18)	<i>Klebsiella pneumoniae</i>	08 12.69
	<i>Proteus mirabilis</i>	07 11.11
	<i>Escherichia coli</i>	03 4.76
Cocci gram positive (n=10)	<i>Staphylococcus aureus</i>	09 14.29
	<i>Streptocoque D</i>	01 1.59

] 30 - 40]	11	10.10
] 40 - 50]	13	11.92
] 50 - 60]	10	09.15
] 60 - 70]	09	08.26
] 70 - 80]	02	1.84
Total	109	100

Fifty-six patients were female (51.37%). The sex ratio M / F was 0.94 / 1. In the ENT history of patients, acute otitis media were found in 16.51% of cases, recurrent rhinitis in 14.67%, ear trauma in 2.75%.

and recurrent pharyngitis in 0.91% of cases. case. Four patients (3.66%) were carriers of HIV and two others were diabetic and one had major sickle cell disease SS.

Clinical aspects

The average consultation time was 16.73 months with extremes of 3 months and 7 years. The 3-6-month delay was most reported in 38.53% of cases.

Purulent otorrhea was the most reported reason for consultation with 88 cases, or 80.73%, followed by earache, which was present in 53 cases, or 48.62%. Figure 1 shows the distribution of patients according to the reason for consultation.

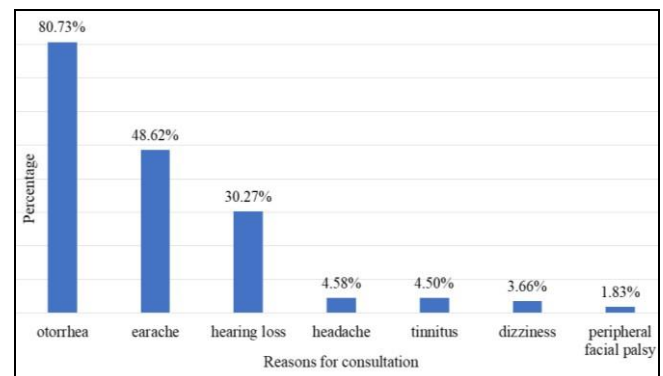


Fig 1: Distribution of patients according to the reason for consultation.

On otoscopic examination, the tympanic perforation was located on the left in 42.20% of cases and was bilateral in 27.52% of cases. Two patients (1.83%) had marginal tympanic perforation. One patient presented with a total tympanic perforation (0.91%), in the other patients the tympanic perforation was non-marginal (97.26%).

Bacteriological aspects

The pus cytobacteriological examination was performed in 58 cases (53.21%). He was sterile in 03 cases, had isolated one germ in 48 cases, two germs in 6 cases and three germs in 1 case. The organisms isolated were Gram negative bacilli, Gram positive Cocci. Table 2 shows the distribution of the different germs isolated.

The comparison of the sensitivity of the most widely used antibiotics compared to the most frequent bacteria is shown in Table 3.

Table 3: Sensitivity in percentage of the most tested antibiotics to the most frequent bacteria

	<i>Pseudomonas aeruginosa</i>	<i>Staphylococcus aureus</i>	<i>Klebsiella pneumoniae</i>	<i>Proteus mirabilis</i>
Amoxicillin + clavulanic acid	-	78	85.71	80
Cefotaxime	62.5	100	71.42	100
Levofloxacin	91	80	66.66	85.71
Ciprofloxacin	85.75	67	71.42	80
Pefloxacin	91.66	85.71	66.66	85.71
Imipenem	96.66	100	100	100
Ofloxacin	86.95	40	-	85.71
Sulfamide	21.42	-	20	50

3.4 Therapeutic aspects

The patients received local and systemic treatment. The probabilistic treatments before obtaining the results of the cytobacteriological examination combined the atrial aspiration with several molecules made up of antibiotics and adjuvant treatments. Systemic probabilistic antibiotic therapy was associated with ciprofloxacin ear drops in 32 cases (29.26%), and rifamycin ear drops in 1 case. Table 4 shows the most commonly used antibiotics by general route. The treatment was readjusted after performing the antibiogram in 13 cases (22.41%). It was the amoxicillin-clavulanic acid combination which had been replaced by a quinolone in all of these cases.

Table 4: Distribution of antibiotics used in probabilistic antibiotic therapy by general route

		Number	Percentage
Penicillins	Amoxicillin-clavulanic acid	57	52.29
Quinolones	Ciprofloxacin	35	32.11
	Ofloxacin	05	4.59
3rd generation cephalosporins	Ceftriaxone	02	1.83
	Cefixime	04	3.67
	Cefpodoxime	06	5.51
Total		109	100

In adjuvant therapy, corticosteroids were used in 37 patients (33.94%), WHO level 1 and 2 analgesics in 18 patients (16.51%), non-steroidal anti-inflammatory drugs in 3 patients (2.75%) and antihistamines in 4 patients (3.67%). The outcome under treatment was considered favorable in 105 patients, ie 96.33% with drying of otorrhea, disappearance of inflammatory signs of the eardrum with or without closure of the tympanic perforation. Three patients presented with recurrent otorrhea with repeated medical checks. In one patient the progression was to otomastoiditis with sequelae peripheral facial palsy.

Discussion Epidemiological aspects

During the study period, SCSOM represented 0.16% of all pathologies recorded in our department. Variable rates have been reported in the literature: 0.60% in Ethiopia [4], 0.96% in Burkina [5], 0.31% in India [6] and 0.45% in Germany [7]. Several intertwined factors such as whether or not hospital data are computerized, antibiotic self-medication, the size of the populations studied and the ease of access or not to quality health care could influence the hospital prevalence of SCSOM.

As in our series, the infantile predominance of SCSOM is often reported in studies [5, 8-10]. This high prevalence in children is explained by the fact that children are more likely to develop otitis media due to the immaturity of their immune status. In addition, the shorter and horizontal nature of their Eustachian tubes, facilitates the passage of

infected material from the nasopharynx to the tympanic cavity. Acute otitis media and recurrent rhinitis were the most common antecedents in 16.51% and 14.67% of cases in our series, respectively. This is justified by the fact that upper airway infections including acute otitis media constitute a significant risk factor for the development and course of uncomplicated COM [11]. According to Triglia and Daly [12, 13] this risk is higher the more the first episode of acute otitis media occurs within the first six months of life. These observations draw our attention to the need for good management of infections of the ENT sphere in general and more particularly of acute otitis media.

The consultation time was long in our series, on average 16.74 months. In the series by Sharma *et al* [6] in India, 40% of patients with SCSOM consulted after 5 years. The often poorly adapted self-medication and the painless nature of SCSOM may explain the long out-of-hospital therapeutic route often observed. In SCSOM, otorrhea is still the most frequent reason for consultation [1, 14, 15]. Indeed, SCSOM is defined as chronic inflammation of the middle ear, which clinically manifests as recurrent discharge or chronic otorrhea through eardrum perforation with conductive hearing loss of varying severity [14].

Bacteriological aspects

The study of the bacteriological profile of purulent otitis media poses difficulties not only in view of the sampling technique used but also in relation to the presence of commensal bacterial flora in the external auditory canal. Just

over half of the patients were able to honor the cytobacteriological examination in our series. This examination, which should be systematic, is difficult to carry out in our context because at the expense of patients, already exhausted by a long therapeutic course. *Pseudomonas aeruginosa* was the bacteria most encountered in our study, followed by *Staphylococcus aureus*. Our observations corroborate those of other authors as in Nigeria^[16] and India^[11, 17]. Uddén *et al* in Angola in 2018^[18] had identified *Proteus mirabilis* (14.7%) and *Pseudomonas aeruginosa* (13.2%) as the dominant pathogens isolated in their study. Mofatteh *et al* in Iran^[19], Sacko *et al* in Mali^[20] found *Staphylococcus aureus* predominant in 64.9% and 41.31% of cases, respectively. *Pseudomonas aeruginosa* is an opportunistic bacterium par excellence and present in the patient's environment (water, food, medical equipment), which explains the contamination by this bacterium. Thus, its known presence in the commensal flora of the external auditory canal does not exclude the possibility of contamination during sampling^[11]. *Staphylococcus aureus*, commensal germ, is the second most often isolated germ, this shows that contamination from the external auditory canal cannot be ruled out. However, these results show that despite some variations in bacterial ecology, two germs frequently return: *Pseudomonas aeruginosa* and *Staphylococcus aureus*.

Therapeutic aspects

The antibiotics most active against the germs in our study were imipenem, amoxicillin/clavulanic acid, cefotaxime, ciprofloxacin and levofloxacin. It should be remembered that the choice of antibiotics is essentially based on epidemiological and bacterial data which must be updated periodically. The first probabilistic antibiotic therapy must be active on the germs usually involved in SCSOM. The study by Legent *et al* in France^[21] comparing the efficacy of ciprofloxacin with that of the amoxicillin / clavulanic acid combination in the treatment of chronic otitis has confirmed the almost constant activity of ciprofloxacin in the chronic otitis; none of the strains of *Pseudomonas aeruginosa* isolated before treatment were resistant to this antibiotic. Miro *et al* in Spain^[22] demonstrated clinical and bactericidal efficacy of local ciprofloxacin in the treatment of otorrhea in chronic noncholesteatomatous open eardrum otitis, with clinical efficacy of 91% and bacteriological efficacy of 89%. In addition to its efficacy, the existence of local forms of ciprofloxacin use remains an advantage in the treatment of SCSOM. Imipenem was found to be the most active antibiotic against bacteria in our study. Its high cost, its injectable-only dosage form and its use in hospitals under strict control reduce the possibilities of its use in outpatient treatment or in self-medication. Its controlled use could explain its high sensitivity rate. Sulfonamides were found to be the least active antibiotics in our study. Chander *et al* in Nepal^[23] who studied the antimicrobial susceptibility profile of clinical isolates of *Pseudomonas aeruginosa*, reported a rate of resistance of *Pseudomonas aeruginosa* to cotrimoxazole in 72.41% of cases. Khan *et al* in Pakistan^[24] in their series, found that *Staphylococcus aureus* was resistant to sulfamethoxazole-trimethoprim in 77.5% of SCSOM cases. Sulfonamides are used in the prevention of opportunistic diseases in immunodeficient people^[25]. This

wide use of sulfonamides as well as their self-medication would explain the emergence of the resistance observed.

Conclusion

This study on SCSOM allowed us to note that they are relatively rare and mainly affect children in the first decade of life in our context of practice. The contributing factors found in the history are generally acute otitis media and recurrent rhinitis. The most frequently found germs are *Pseudomonas aeruginosa* and *Staphylococcus aureus*, sensitive to imipenem, amoxicillin / clavulanic acid and fluoroquinolones. Although the progress under treatment is generally favorable, monitoring of bacterial ecology in SCSOM should be regular because it allows us to know the frequent germs and their sensitivity to antibiotics for a rational probabilistic treatment. National studies on the bacterial ecology of ear infections in general and SCSOM in particular should be conducted to identify practical algorithms for the management of COM in Togo.

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