Antibiotics Prescriptionsin the Otolaryngology Department of the Departmental and Teaching Hospital of Borgou-Aliboriin 2020

ABSTRACT

Aims: The aim of this study was to assess the quality of antibiotic prescriptions in the ENT department of the Departmental and Teaching Hospital of Borgou-Alibori (DTH-BA).
Study design: This was a prospective descriptive study.
Place and Duration of Study: Departmental and Teaching Hospital of Borgou-Alibori (DTH-BA), from June 15 to September 15, 2020.
Methodology: All patients admitted to the department during the study period who had received a on for an antibiotic and had given informed consent were recruited exhaustively. A team of experts consisting of an infectious diseases physician and an ENT physician was responsible for analyzing and assessing the quality of antibiotic prescriptions.
Results: Of the 455 consultations recorded over the period, 141 patients were included, 132 of them treated on an outpatient basis and nine hospitalized. The most frequently diagnosed conditions were acute otitis media (AOM) in 36 patients (25%), chronic otitis media (COM) in 24 patients (16.7%) and sinusitis in 14 patients (9.7%). The most commonly prescribed antibiotics were penicillins (84 patients or 59.6%), followed by macrolides (30 patients or 21.3%) and cephalosporins (21 patients or 14.9%). Antibiotic therapy was justified in 54.6% of cases, and dosage and duration were correct in 73.9% and 37.7% respectively.
Conclusion: This study suggests that ENT doctors should be given more training in the basics and procedures for the proper use of antibiotics.

Keywords:*Otorhinolaryngology, Antibiotics, Prescription, Hospital, Benin*

1. INTRODUCTION

The uncontrolled use of antibiotics is a very common practice in developing countries. It is perpetuated by the absence of therapeutic protocols and guidelines for the proper use of antibiotics [1]. Added to this is the lack of initial and ongoing training in antibiotic therapy. Antibiotic resistance is an inevitable consequence of antibiotic misuse. It restricts the margin of intervention, increases the rate of antibiotic treatment failure and, consequently, that of severe morbidity and mortality [2]. Faced with the scale of the situation the World Health Organization (WHO) has drawn up a global action plan against antimicrobial resistance, as recommended by resolution WHA68.7 of the 2015 World Health Assembly [3]. Rationalizing the use of antimicrobials is one of the main objectives of this plan. It is therefore necessary to take stock in several contexts of the use of these products, to identify the factors favoring misuse with a view to providing solutions appropriate to each context [4].

Ear, nose and throat (ENT) infections are very common. The germs involved vary according to the site of infection, the patient's age and the season. Viral infections are very numerous, and in the majority of cases are a source of unjustified antibiotic therapy. The absence of rapid diagnostic tests and limited access to microbiological examinations, either because of their cost or because of the inadequacy of technical facilities, expose caregivers to over-prescription of

antibiotics [5]. Some studies carried out in developed countries have shown that antibiotic therapy is administered in approximately 40% of all consultations for rhinopharyngitis and 80% for bronchitis [6, 7].

In Benin, a 2017 study showed that 76.8% of general practitioners routinely prescribed an antibiotic to children presenting with acute otitis media [6]. The main reasons given for this treatment were the practice of antibiotic-based self-medication started by mothers before the consultation, the uncertainty of seeing the child again for a check-up, and the fear of locoregional spread of the infection or sepsis [6]. Against this backdrop, we felt it necessary to assess the practice of hospital-based antibiotic therapy by ENT specialists themselves.

2. METHODS

2.1 Type, period and study population

This was an observational, cross-sectional and descriptive study, with prospective data collection. The data collection phase lasted 03 months, from June 15, 2020 to September 15, 2020. The study population consisted of all patients seen in the ENT department during the data collection period.

2.2 Inclusion criteria

All patients treated as outpatients or hospitalized during the data collection period for an ENT condition, who had received a prescription for an oral or injectable antibiotic, and who had given informed consent to participate in the study, were included in the study.

2.3 Data collection

For patients treated on an outpatient basis, we began by checking the medical orders (MOs) immediately after the consultation. Patients who had received a prescription for an ATB were interviewed on the basis of a pre-established questionnaire. This questionnaire was drawn up under the expert guidance of an infectiologist and an ENT doctor, both of whom are experts in antibiotic therapy.Socio-demographic data, disease history, previous treatment, medical history and drug allergies were collected during this interview. Diagnostic and paraclinical data were collected directly from the patient's chart. A digital copy of each medical prescription was then made, enabling the therapeutic data to be entered. The file number, patient contact and date of follow-up appointment were noted. Information on treatment costs and evolutionary data were collected at the follow-up appointment.

In the case of hospitalized patients, the questionnaire was also administered, and certain data were collected from medical records and prescriptions.

2.4 Assessment of antibiotic therapy quality

An infectious diseases physician and an ENT physician, both experts and referents in antibiotic therapy, assessed the quality of antibiotic prescriptions. Antibiotic therapy was justified if the diagnosis made required antibiotic therapy. It was appropriate when microbiological criteria were met, i.e. when the choice of molecule was in line with the sensitivity profile of the targeted germ. Toxicological criteria were also assessed (i.e. whether the molecule chosen was the most tolerated possible); ecological criteria (whether the antibiotic chosen had the least effect on the microbiota); and economic criteria (whether it was the least expensive of the effective ones). We also assessed whether the dose and duration of treatment were correct, and whether the route of administration was appropriate.

2.5 Data analysis

The data collected was recorded using Epi-data 3.1 and analyzed using Epi-info 7.2. After entry, data were checked for consistency and any data entry errors. Categorical variables were expressed as percentages, and quantitative variables as mean and standard deviation when normally distributed, and as median and interquartile range (IQR) when not.

3. RESULTS AND DISCUSSION

3.1 RESULTS

Of the 455 consultations recorded during the study period, 141 met the study criteria. **Figure 1** shows the flow chart for the study.

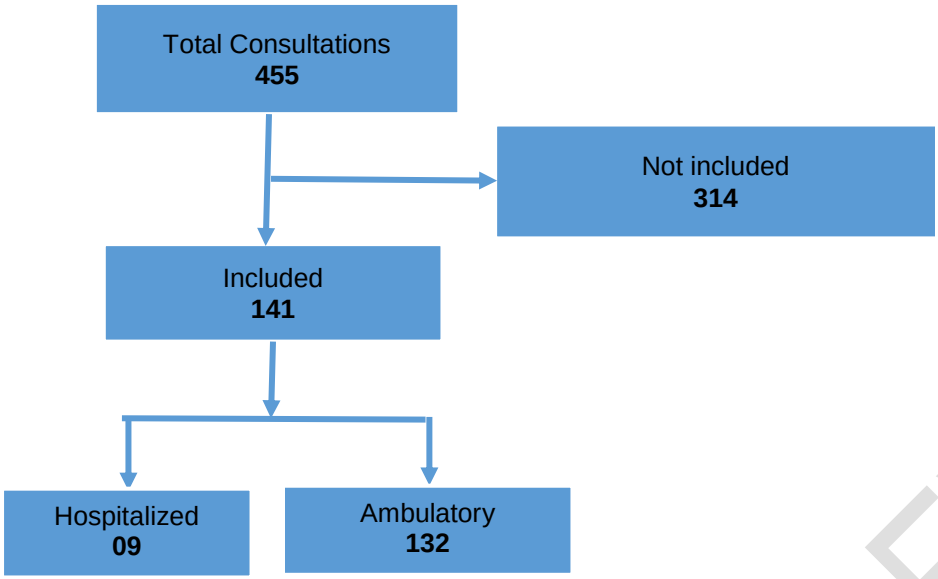

Fig 1. Study flow diagram

Socio-demographic characteristics

Of the 141 patients included, 67 were male, for a sex ratio of 0.9. Mean age was 28.9±19.4 years. Treatment was carried out on an outpatient basis for 132 patients (93.6%), and 9 (6.4%) were hospitalized. **Table 1** shows the socio-demographic characteristics of those surveyed.

Table 1. Distribution by socio-demographic characteristics of patients who received an antibiotic prescription in the ENT department of DTH-BA in 2020 (N=141)

	N	%
Gender		
Men	67	47.5
Woman	74	52.5
Age groups (years)*		
≤10	30	21.3
]10-20]	19	13.5
]20-30]	33	23.4
]30-40]	26	18.4
]40-50]	12	8.5
]50-60]	12	8.5
>60	9	6.4
Socio-professional occupation		
Student	42	29.8
Civil servant/ retired	20	14.2
Self-employed	44	31.2
Housekeeper	16	11.4
Unemployed	19	13.4
Place of residence		
Urban	79	56.0

Rural	62	44.0
Education level		
None	31	22.0
Literate in local language	14	9.9
Primary	30	21.3
Secondary	40	28.4
University	26	18.4
Monthly income		
< minimum wage [1]	56	39.7
≥ minimum wage	85	60.3

*****38 patients were children aged 0-15 years.
[1]Minimum Wage in Benin is US$85.

Main reason for consultation and time taken

The average consultation time was 73.7 days ranging from one day to 48 months. In 36.1% of cases, patients were seen more than 15 days later (**Figure 2**). The main reasons for consultation were otalgia in 42 cases (29.79%), otorrhea in 23 cases (16.31%), a painful cervico-facial mass in 18 cases (12.77%), odynophagia in 15 cases (10.64%) and rhinorrhea in 12 cases (8.51%).

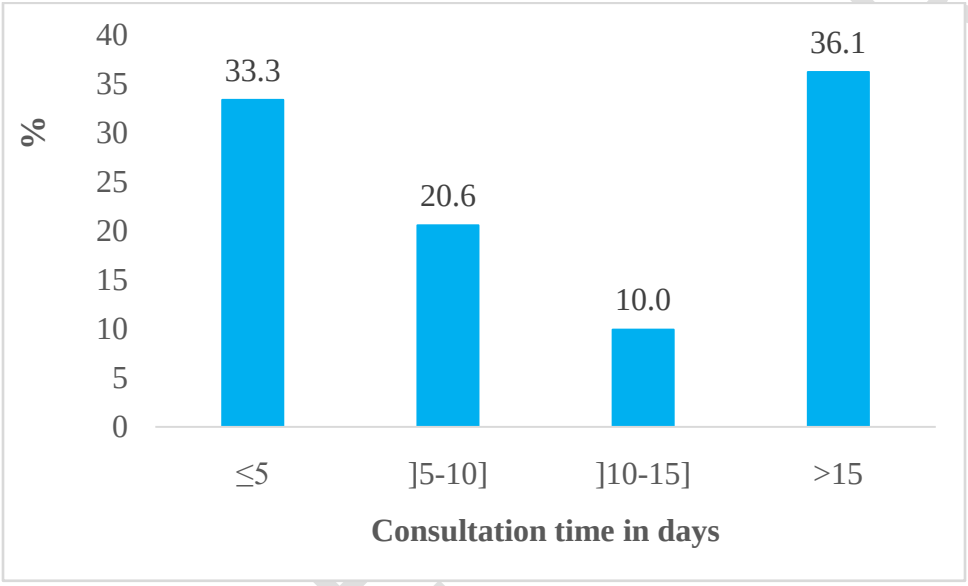

Fig 2. Distribution of respondents by consultation time (N=141).

Previous treatment

Forty-five (31.9%) patients had previously used antibiotics prior to their consultation. The antibiotic family most frequently used by these patients was the beta-lactam family (82.2%). The average number of days of use for each family of ATBs was 5.0±2.8 days; 7.0±5.1 days and 3.8±2.2 days respectively for betalactams, imidazoles and macrolides.

Diagnosis and microbiological data

Diagnosis

Of the 141 patients consulted, 134 (95.0%) had a single condition, and 07 (5.0%) more than one. The most frequent conditions were otological (54.9%), followed by naso-sinus (17.4%), pharyngolaryngeal (16.7%) and cervico-facial (11.0%). **Table 2**shows the various conditions diagnosed in the respondents.

Table 2. Breakdown of respondents by diagnosed condition

	N	%
Otological disorders (N=79)		
Otitis externa	12	15.2
Inflammatory polyp of the EAM[α]	1	1.3
Perichondritis	4	5.0
Abscess	2	2.5
AOM[β]	36	45.6
COM[δ]	24	30.4
Rhino-sinus conditions (N=25)		
Abscess	1	4.0
Rhinitis	10	40.0
Sinusitis	14	56.0
Pharyngolaryngeal disorders (N=24)		
Adenoiditis	1	4.2
Tonsillitis	9	37.6
Laryngitis	1	4.2
Pharyngitis	12	50.0
Uvulitis	1	4.2
Cervico-facial disorders (N=16)		
Abscess	1	6.2
Adenitis	7	43.8
Cellulite	8	50.0

α = external acoustic meatus; β = acute otitis media; δ = Chronic otitis media

Microbiological data

Cytobacteriological examination of the pus was carried out in 8 patients (5.7%). **Table 3** shows the different bacterial isolated.

Table 3. Distribution of respondents according to results of cytobacteriological examinations of pus.

	N	%
Confirmation of infectious origin (N=141)		
Yes	8	5.7
No	133	94.3
Germ identified (N=8)		
Yes	7	87.5
No	1	12.5
Bacterial isolated (N=7)		
*Klebsiella aerogenes**	1	14.3
Pseudomonas aeruginosa	1	14.3
Coagulase-negative Staphylococcus	1	14.3
Staphylococcus aureus (Staphylococcus aureus)*	3	28.6

Streptococcus pneumoniae	2	28.6

*A bi-microbial infection associating *Klebsiella aerogenes* and *Staphylococcus aureus* was found

Characteristics of antibiotic therapy among respondents

A total of 150 antibiotics were prescribed. The average number of antibiotics prescribed per patient was 1.1±0.3. Monotherapy was used in 133 patients (94.3%), dual-antibiotic therapy in seven (5%) and triple-antibiotic therapy in one (0.7%).
Of the eight antibiotic combinations prescribed, seven were used in hospitalized patients.
Antibiotic therapy was probabilistic in 134 patients (95%) and documented in 7 (5%). Generic antibiotics were used in 101 cases (67.33%) and non-generic antibiotics in 49 cases (32.67%).
Betalactams (70%) and macrolides (20%) are the most commonly prescribed antibiotics. **Table 4** shows the different antibiotics prescribed to the patients surveyed.

Table 4. Distribution of respondents according to antibiotics received (N=150).

	N	%
Penicillins	**84**	**56**
Amoxicillin+ clavulanic acid	80	53.3
Flucloxacillin	4	2.7
Macrolides	**30**	**20**
Azithromycin	21	14
Lincomycin	9	6
Cephalosporins	**21**	**14**
Cefpodoxime	12	8
Cefixime	5	3.3
Ceftriaxone	4	2.7
Nitro-imidazole (metronidazole)	**8**	**5.3**
Quinolones	**6**	**4**
Ciprofloxacin	5	3.3
Levofloxacin	1	0.7
Aminoglycosides (gentamicin)	**1**	**0.7**

*****Apatient may use more than one antibiotic

Assessing the quality of antibiotic prescriptions

The mean duration of antibiotic treatment was 8.6±3.4 days. The duration of treatment was specified on the medical prescription for all patients.
Antibiotic therapy was justified in 54.67% of cases, and dosage was correct in 73.9% of cases. **Table 5** shows the results of our assessment of the quality of antibiotic prescriptions.

Table 5. Assessment of the quality of antibiotic prescriptions among patients surveyed.

	N	%
Justification of the prescription (N=141)		
Yes	77	54.6
No	64	45.4
Compliance with microbiological criteria (N=77)		
Yes	69	89.6
No	8	10.4

Compliance with toxicological criteria (N=69)		
Yes	26	37.7
No	43	62.3
Compliance with ecological criteria (N=69)		
Yes	25	36.2
No	44	63.8
Compliance with economic criteria (N=69)		
Yes	24	34.8
No	45	65.2
Dosage compliance (N=69)		
Yes	51	73.9
No	18	26.1
Duration of treatment (N=69)		
Correct	26	37.7
Too long	42	60.9
Too short	1	1.4

3.2 DISCUSSION

This study is one of the first reported in Benin to describe antibiotic therapy in ENT departments. Once again, it highlights the undocumented use of antibiotics, which do not comply with national criteria or regulations that often do not exist in developing countries. The average age of the subjects included in the study was 28, and around 21% of patients were under 10 years of age. Acute otitis media accounted for 45.6% of otological cases, while sinusitis accounted for 56% of rhino-sinus infections. This observation has been made in other studies, making AOM the most frequent otological infection, leading to over 20 million antibiotic prescriptions annually [5, 8-10]. Delays in patient consultation and inadequate management in peripheral centers are among the causes of the high proportion of suppurative otitis observed. Indeed, as described by certain authors in Zambia, one of the challenges in African countries remains the scarcity or poor health coverage of certain specialties such as ENT [11, 12].

In the present study, only 8 samples were taken for cytobacteriological examination of the pus. Indeed, cases of suppuration merit diagnostic confirmation in order to ensure proper management according to the antibiotic susceptibility profile. *Staphylococcus aureus* was found in 3 of the 8 cases sent to the laboratory. These results are in line with studies carried out in Tanzania and the United States, where authors have also found *S. aureus in* otitis suppurations [13, 14] while in Malaysia, *Pseudomonas aeruginosa* was the most isolated germ [15]. The low number of paraclinical investigations is explained by the fact that, for many non-severe conditions, the course is generally favorable. Moreover, for certain conditions (otitis, pharyngitis and sinusitis), the bacteria responsible and their sensitivity to antibiotics are generally well known [16].

Betalactam antibiotics, and specifically the combination of amoxicillin and clavulanic acid, were most widely prescribed for ENT infections, as in other studies [17, 18]. In a study carried out in London in 2019, the authors found that penicillins and macrolides respectively accounted for 50% and 13% of prescriptions in ENT infections [16]. Similarly in Mali, at the Sikasso hospital, a prospective study found that the top three antibiotic prescriptions were amoxicillin + clavulanic acid, third-generation cephalosporins and macrolides [17]. In fact, according to the recommendations of the French ENT Society and depending on the type of otological or sinus infection, amoxicillin remains the first choice, followed by amoxicillin + clavulanic acid [19]. In other countries, however, such as South Africa, some 89% of general practitioners surveyed admitted prescribing antibiotics for sinusitis, and 10% of these prescriptions were in the carbapenem class [20]. The choice of amoxicillin + clavulanic acid in our context can also be explained by its generally affordable cost. Around 32% of patients included in the study had already taken antibiotics before consulting an ENT doctor. Self-medication is a frequent cause of delayed treatment and, above all, of antibiotic resistance in our countries [21-23].

In the present study, all prescriptions were submitted to antibiotic therapy referents for assessment, in order to identify shortcomings and strengths in terms of antibiotic therapy. It was found that, in 62.3% of cases, the duration of treatment was deemed inadequate, as was the dosage in 26.1% of cases. Indeed, since 2006, a study carried out in Cotonou health facilities had reported that only 29.6% of antibiotic prescriptions were deemed correct [24]. Incorrect antibiotic prescribing

remains a topical public health issue worldwide. Only 54.7% of antibiotic prescriptions in this study were justified. Some prescriptions were made for viral infections such as tonsillitis, rhinitis or otitis externa. Therapeutic recommendations emphasize the non-routine nature of antibiotic therapy. Some studies indicate that the majority of AOM cases heal spontaneously, but in all cases, it is important to look for signs of severity according to the patient's age, while assessing toxicological, ecological and economic factors [25].

4. CONCLUSION

This study presents the main problems limiting good antibiotic therapy practice in the ENT sphere, in particular the non-existence of national recommendations, the non-existence of care guidelines, difficulties in accessing microbiological tests, and inadequate antibiotic therapy training for caregivers. Solving these identified problems, coupled with educating the population about the risks of self-medication, could help reduce the rate of inappropriate antibiotic use and preserve their effectiveness over the long term.

CONSENT

All participants in this study gave written informed consent. Completion of the consent letter was a prerequisite for starting the questionnaire.The emancipated adolescents gave their consent to take part in the study. For children under 15, the consent of the accompanying parent was obtained.

ETHICAL APPROVAL

This study was conducted with the approval of the local ethics committee for biomedical research of the University of Parakou (N° 0337/CLERB-UP/P/SP/R/SA). It was carried out in compliance with current ethical standards. Informed consent was obtained from all included patients. Confidentiality was maintained throughout the data collection and analysis phase.

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