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Evaluation of the Quality of Prescription of Antibiotics with Curative Intent in a Specialized Department in Dakar, Senegal

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Abstract

Background: Wide prescription and misuse of antibiotics have led to the emergence of resistant bacteria. The evaluation of professional practices is a way of contributing to the improvement of prescription. Our work aimed at assessing the quality of antibiotics prescription with curative intent in a clinic of infectious diseases in Dakar with reference to national recommendations.

Methods: A observational study was conducted from April 2 to July 2, 2012 based on the records of all hospitalized patients, aged 15 and above, having received antibiotic therapy with curative intent. The quality of the prescription was evaluated according to the national recommendations of PRONALIN which served as a reference. Thus two levels of appreciation, appropriate and inappropriate were used.

Results: During the period from 02/04/2012 to 02/07/2012, 170 patients received antibiotic therapy (53.79%), among whom 267 antibiotic prescriptions were made. Monotherapy was received by 57.70% of patients. The most prescribed antibiotic family was β-lactams (55.43%). Antibiotic therapy was probabilistic in 155 (91.18%) prescriptions. Compliance rate of antibiotic prescription to national recommendations was 74.7%. The prescriptions according to the molecules were appropriate in 97.37% of the cases. Dosages were adequate in the majority of prescriptions (90.63%). The routes of administration were observed for almost all of molecules (98.87%). The duration of treatment was not appropriate in 119 cases (44.56%). Only 15.9% of antibiotic therapy was assessed at 48 hours.

Conclusion: Compliance rate of antibiotic prescription to national recommendations was 74.7% in this infectious disease department of Dakar mainly due to unfulfilled treatment times and the lack of evaluation of antibiotic therapy after 48 hours of administration. Although the prescription of antibiotics in this clinic specializing in infectious diseases remains good, the emphasis should be on regular training of health workers and on better dissemination of national guidelines.

Keywords: Antibiotic Therapy, Prescription, Curative Intent, Evaluation of Professional Practices, Dakar

Introduction

Antibiotics are natural substances, synthetic or semi synthetic which may inhibit or destroy the bacterial agents. Since the discovery of penicillin by Sir Alexander Fleming in 1928, antibiotic therapy has revolutionized the treatment of bacterial diseases, improving their prognosis. Today, antibiotics are the primary weapons available to prescribers for the treatment of bacterial infections. However, their widespread prescription and misuse have led to the emergence and spread of resistant bacteria or multidrug Chemicals [1]. However, this resistance causes not only an increase in morbidity and hospital mortality, but also the cost of the treatment of bacterial infections.

The causes of the emergence and spread of bacterial resistance are various; however, excessive or inappropriate use of antibiotics is the key determinant [2]. Their misuse has ecological consequences.

In Africa, limited data are available on the quality of hospital antibiotic. A study conducted in 2010 at the regional hospital of Saint-Louis in hospitalized patients reported 51% of regular antibiotic prescriptions [3]. Most of these studies involved emergency services; rarely focus on specialized infectious diseases services where an exemplary antibiotic prescription should be expected. Also, the evaluation of professional practices is a way of contributing to the improvement of proper prescription by diagnosing problems and proposing solutions. In Nigeria, Akoria *et al* [4]. Shown that pharmaceutical representatives were the most popular sources of

drug information; influences during internship contributed most to current prescribing. Both should be targeted in interventions to improve prescribing.

Worldwide, especially in Western countries, many consensuses have established recommendations over the past decade in order to optimize the quality of the use of antibiotics in medicine [5-10]. In Africa, particularly in Senegal, four booklets were developed in 2010 for a proper use of antibiotics destined to practitioners and health facilities, taking into account all these remarks, These booklets were drafted, based on international and national consensus-based [11-14]. This study on the evaluation of professional practices in curative antibiotic therapy at the Clinic of Infectious Diseases of Fann National University Hospital CHNU) with the objective of evaluating quality of curative antibiotic prescription in a clinic of infectious diseases according to national guidelines.

Methodology
Patients and Methods
Our study was conducted at the "Ibrahima Diop Mar" Clinic of Infectious Diseases at the National University Hospital (CHNU) of Fann. This health facility is a national reference center for the management of infectious diseases, with a capacity of 56 functional beds. It is also a service whose expertise is sought in the prescription of antibiotics during bacterial diseases. The staff prescribing antibiotic at the time of the study was composed of five professors, a referring doctor in charge of the committee against nosocomial infections or CLIN, five deputy clinicians, two hospital Intern, 21 specializing doctors, including students at their 7 years of study in medicine.

A prospective observational study based on the records of all patients aged 15 and above, hospitalized at the clinic of infectious and tropical diseases CHNU of Fann who, having received antibiotic treatment with curative intent (excluding treatment containing anti-TB drugs) was conducted over a period of three months, from April 2 to 02 July 2012. During this period, the records of all inpatients meeting the selection criteria were recruited by specializing doctor in charge of the study and data were collected from the beginning to the end of hospitalization (output, transfer or death) in a previously tested questionnaire. Following the development of the questionnaire, ten questionnaires were given to different doctors practicing in the department to fill out the different items from the clinical records of the patients, in order to judge the clarity of the questions asked. The test was performed in a different unit from the work unit of the selected physician. This previously tested questionnaire was used to collect the following data: epidemiological (card number, date of entry and exit, name, first name, age, gender), clinical (previous antibiotic therapy, primary diagnosis and / or partner, the site of infection (such as low respiratory, meninges, urinary, digestive, and skin), the community nature of infection (when contracted in the community) or nosocomial (acquired infection in a patient), Para clinical (such with drawals of blood culture, urine culture, stool, fluid aspiration, bacterial serology), isolated germs and antibiotic), therapeutics (prescribers, empirical antibiotic therapy, alone or associations, molecules, dosage, route of administration, pace, duration, evaluation of antibiotic therapy to 48 hours with or without modification of the initial antibiotic therapy), scalable (hospital stay, recovery , transfer, discharge or death).

The quality of prescription was assessed according to national guidelines of the National Nosocomial Control Programme

(PRONALIN) which served as reference [10-13]. As a result, two levels of assessment, appropriate and inappropriate (questionable and unacceptable) were used. The prescription was considered appropriate if the indication, the choice of the molecule, dosage and mode of administration, the possible association, were in accordance with recommendations. The prescription was deemed inappropriate in other cases. An inappropriate prescription could be questionable or unacceptable:

Questionable: if the or molecule (s) selected could have been replaced by the or molecule (s) of reference, but remained active on the susceptibility, or that if it was a first choice for a second intention molecule;

Unacceptable: if the molecule or the combination selected corresponds neither to the recommendations nor to the susceptibility (intrinsic or acquired resistance of the germ), or when antibiotic therapy is considered unnecessary. The dosage is appropriately called when it conforms to recommendations. Dosage is considered inappropriate when there is under dose or overdose. The route of administration is considered appropriate when it matches to the recommendations. The route of administration is called inappropriate when it is not consistent with the recommendations. The duration of the prescription is considered appropriate when it matches the recommendations. The duration of the prescription is considered inappropriate when it is too short or too long compared to the recommendations. The rhythm is appropriate when consistent with recommendations. The rhythm is inappropriate when violating the frequency of daily doses, taking into account the half-life of the molecule. The association is considered appropriate when consistent with recommendations. The association is considered inappropriately when it is not consistent with the recommendations.

Statistical analysis
Data entry and analysis was done using Epi Info 2000 version 3.5.4 , CDC / WHO (Atlanta) 30 july 2012, of the comparison of qualitative data was done using the Chi-square or Fisher test, whereas quantitative data were managed using ANOVA (comparison of variances) or non parametric Kruskal-Wallis test when necessary. Statistical significance of results was $p < 0.05$.

Constraints
The main constraint of our work was the lack of bacteriological sampling performed in many patients, often for financial reasons, thus limiting the use of our data.

Ethical considerations
The Head of the Department of Infectious Diseases approved this prospective study. All data collected were anonymized prior to analysis.

Results
Epidemiological data
During the period from 02/04/2012 to 02/07/2012, 316 patients were hospitalized in the department, of which 170 have received antibiotic therapy in curative intent or a prevalence of 53.79%. Sixty-five (38.2%) were admitted in April, 53 (31.2%) in May, 50 (29.4%) in June and two (1.2%) in July. The sex ratio (102M / 68F) was 1.5. Only 30 of 170 patients, 17.6% started antibiotic therapy before hospitalization.

Diagnostic data
Topographically, the mostly diagnosed infection was low respiratory (75 cases or 30%), meningeal (66 cases or 26.4%) and gastrointestinal (43cas 17.2%) (Figure1).
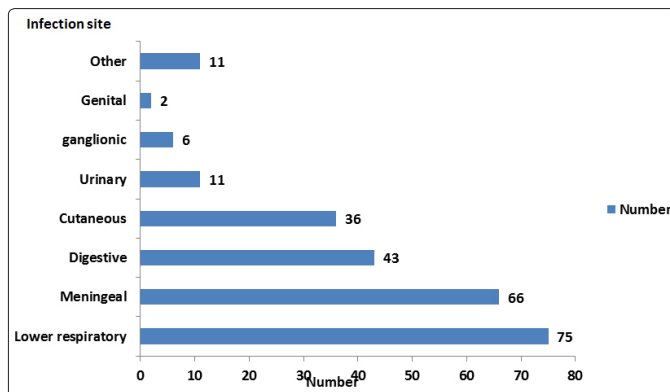
Figure 1: Distribution of antibiotic prescription with curative intent by infection site in infectious diseases department of Fann university hospital

In addition, according to primary diagnosis, the most frequent pathologies were bacterial pneumonia (48 cases or 28.23%) among respiratory infections, followed by 37 cases bacterial meningitis or 21.80% among neuro-meningeal infections, opportunistic gastrointestinal bacterial infections during HIV infection (25 cases or 14.70%) and generalized tetanus (23 cases or 13.52%). Of the 170 infections listed, the causes of 160 were community related (94.2%) and 10 (5.8%) nosocomial.

Bacteriological data
In total, 213 samples were realized for etiological purpose. The most common were analyzing cerebrospinal fluid 44 times or 20.65%, urine culture 41 times or 20.65% and blood culture, 37 times or 17.37%.

Prescription data
The majority of prescriptions were performed by specializing doctors 61.80%, and 37, 6% by & year medical students. Of the 170 records, 267 antibiotic prescriptions were curative-oriented. Ninety-three patients (54.70%) received curative monotherapy and 77 patients (45.30%) two or three antibiotics. Antibiotic therapy was probabilistic in 155 prescriptions (91.18%) and documented on the basis of susceptibility testing in 15 cases (8.82%). Regarding antibiotic combinations, it was a combination therapy in 54 cases (70.12%) and triple therapy in 23 cases (29.87%). The most common antibiotics associations included: Amoxicillin-acid clavulanique-spiramycin (29 times or 66%), ceftriaxone, metronidazole (9 times or 11.7%), ceftriaxone, metronidazole, gentamicin (8 times or 10.4%). Seven different combinations of three antibiotics were found, the two most frequent were: gentamicin ceftriaxone + metronidazole + (8 times) and ceftriaxone + metronidazole + cotrimoxazole (5 times). The β-lactams have been mostly used, accounting for more than half of the prescriptions (148 or 55.43%) followed by imidazole (44 or 16.5%) and macrolides (37 or 13.9%). Fluoroquinolones occupy the sixth place (4.9%). The most prescribed antibiotics were ceftriaxone (74 or 27.7%), amoxicillin-clavulanic acid (46 or 17.2%) and metronidazole (41or 15.4%).

Overall, the quality of the prescription is deemed appropriate 127 times (74.7%), 30 times questionable (17.7%) and unacceptable 13 times (7.6%) (Figure 2).
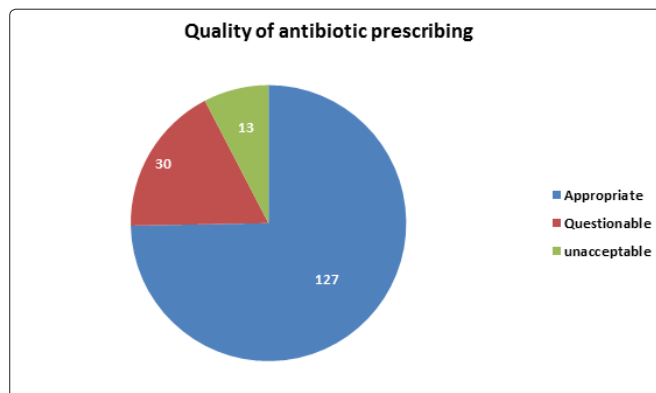
Figure 2: Distribution according to quality antibiotic prescription with curative intent in infectious diseases department of Fann University Hospital

This quality prescription was appropriate in most infectious households concerned. For the three main sites, the antibiotic prescription was appropriate 52/75 times in respiratory infections; 50/66 in neuro-meningeal infections; 26/43 in gastrointestinal infections. The comparison of the quality of the prescription of each site concerned with respect to the other sites did not show any significant differences. This distribution of the quality of prescription according to the site is shown in [Table 1].

Table 1: Distribution of the quality of the prescription with curative intent according to the site of infection in infectious diseases department of Fann University Hospital

Site	Antibiotic prescription			Total	p value
	Appropriate	**Questionable**	**Inacceptable**		
Respiratory	52	18	5	75	0.602
Meningeal	50	10	6	66	0.382
Digestive	26	13	4	43	0.318
Cutaneous	32	2	2	36	0.129
Urinary	9	2	0	11	0.701
Ganglionic	3	1	2	6	0.449
Genital	1	0	1	2	0.976
Other	6	3	2	11	0.199
Total	179	49	22	250	

The requirements were appropriate in bacterial pneumonia and tetanus. They were inadequate in ischemic stroke and viral encephalitis that are not of bacterial cause. The requirements based molecules were appropriate in 260/267(97.37%). The doses were observed in the majority of prescriptions 242/267 (90.63%). The routes of administration were observed for almost all molecules 251/267(94.00%). The rate of administration was respected on most prescriptions 264/267 (98.87%). Intravenous represented 186 cases (69.66%), the oral 66 cases (24.72%) and 15 cases intramuscular route (5.61%). The duration of prescriptions based on molecules was not appropriate in 119 cases on the 267 (44.56%); too long in most cases.

Evolutive data

The average time of hospitalization of patients was 14 ± 11 days with a range of 0-57 days. This time by gender was 13.9 ± 10.65 days for women and 14.0 ± 11.65 days for men. The difference was not significant (p = 0.9314). Evaluation of antibiotic therapy after 48-72 h was performed in 27 cases or 15.9% of the 170 patients. Of the 170 patients, 60 (35.5%) received antibiotic modification while 110 (64.7%) had not had. Antibiotics changes were spectrum enlargements in 83.33% (50 times) while 16.66% cases (10 times) were change to a narrower spectrum antibiotic. 170 hospitalized patients, 110 had evolved towards healing. Whatever the quality of the prescription, healing was the rule in 69.2% of cases (figure 3). There was no significant difference in deaths with or without modification of the initial antibiotic therapy. The time of hospitalization was almost the same, regardless of the quality of antibiotic prescription (p = 0.8106).
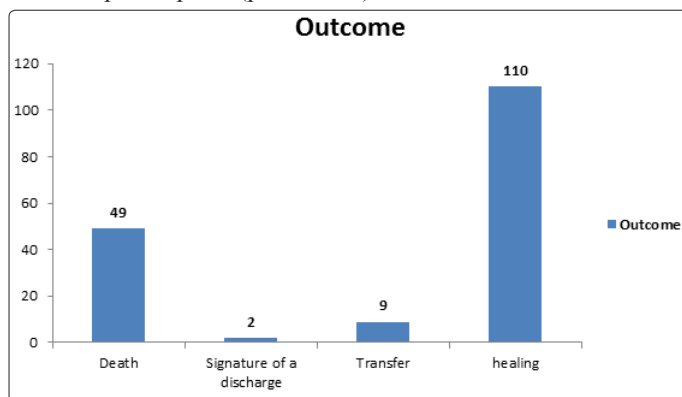
Figure 3: Outcome of inpatients in infectious diseases department of Fann university hospital

Discussion

This was a prospective descriptive and analytical study on the assessment of the requirement of curative antibiotic therapy at the clinic of Infectious and Tropical Diseases of the National University Hospital in Fann. This work aimed at collecting 170 patient records, hospitalized at the clinic from 02 April 2012 to 2 July 2012 and who received 267 curative antibiotic prescriptions, regardless of the site of infection. In most developing countries, there is little or complete lack of antibiotic prescribing policy. These results in a situation where antimicrobial agents are bought and consumed indiscriminately, thus leading to drug abuse. The ugly consequence is the development of resistance by microorganisms to these antimicrobial agents [15]. Senegal is one of the few countries in western Africa to have a national antibiotic prescription guide. However, this guide must be revised regularly on the basis of local studies, notably on the resistance profile of the bacteria most commonly encountered during infections. Resistance is a local problem because the same resistant drugs here can still be very powerful elsewhere [16].

Epidemiology

The prevalence of 53.79% among inpatients is lower than Wang's study in which 77.5% received antibiotic therapy. Our clinic of Infectious Diseases hospitalized many patients living with HIV whose first opportunistic infection was tuberculosis, a disease whose treatment was not taken into account. In our study, the sex ratio was 1.5 with male predominance, as found in other studies whereas in the study of Lakhe conducted out of the capital [14-16, 3], it was 0.59 for women. The average age was $41, 2 \pm 13, 6$ years, ranging from 15

to 86 years. This value reaches data from the literature conducted by Dia et al who found the age group of 46-60 years [17]. Goulet had [18], in turn, an average age of 48.6 years and extremes of 16 and 95 years. The requirements were assured by specializing doctors 61.8% of cases and 37, 6% by year 7 medical students in. This result was also found in the series of Dia et al who found 54.9% in specializing students and (35.4%) hospital Interns [17]. Similarly, other studies have shown that prescribers were respectively 66%, 69%, 50.7% seniors and 17%, 21% and 35.1% were interns. Of the 170 patients [18-20], 30 or 17.6% received antibiotics before admission, which was also notified by Lakhe 23.7%; In the study of Martinez et al on the audit of antibiotic prescriptions in severe community-acquired pneumonia in adults at a university hospital, one third of patients had received antibiotic therapy before hospitalization [3, 21].

Diagnosis

In our study, 30% of infections were mostly lower respiratory, 26.4% and 17.2% meningeal digestive. These results are very similar to the data available in other sources. Patry *et al* [22]. Revealed that in the region of Paris, the main sites of infection were 23.5% in lung and urinary 12.5%. Pulcini *et al* [23]. Found (39%) of lung infections, (18%) urinary tract and (13%) gastrointestinal. In Nice, Roger *et al* [24]. Also identified diagnostics focusing on the broncho- pulmonary infections in 43% and 13% in urine. The study conducted by WHO in three West African regions found bronchopulmonary infections (25.5%) in Senegal followed by meningeal (11.6%) and urinary (5.4%). Gennai *et al* also found urinary tract infections (25.6%) [8, 25], lung (24.2%) and skin (16.6%). Dia *et al* listed pneumonia in 48% of neuromeningeal infections 14% and urinary tract infections in 11% [17]. David Ouakine *et al* found predominance of respiratory infections (36%) and urine (25%) [26]. For Cleve *et al* [27]. Treated infections were predominantly respiratory (53%), digestive (24.6%) and rarely urinary origin (5.9%). In our study, 94.1% of infections were community related against 5.1% nosocomial. This result is similar to the one of Mechkour *et al* who found community infections in 66% and 33% in nosocomial's [28]. According Patry *et al* [22], the prevalence survey "any given day" has shown that the Community related infections account for 41.8% of prescriptions and hospital infections 34.9% of antibiotic use. In our study, 213 samples were taken, mainly comprising 20.65% of cerebrospinal fluid analysis, 20.65% of cytobacteriological urinalysis and 17.37% of blood cultures. These data are comparable to those of Dia *et al* who had blood cultures found in 36.36% of the 110 samples from patients put on antibiotics [17]. For Mechkour *et al* [28], 80% of patients had received microbiological samples in 63% of infectious sites and one or more microorganisms were found. For Goulet *et al* [18], 56 microbiological samples were taken in 44 of 104 patients, in 42.3% of patients including urine culture in 59% of cases and blood cultures in 34% of cases. In our context, many patients did not benefit bacteriological examinations, due to the lack of financial means.

Prescription

Compliance rate of antibiotic prescription to national recommendations was 74.7% in this infectious disease department of Dakar mainly due to unfulfilled treatment times and the lack of evaluation of antibiotic therapy after 48 hours of administration. In fact, the re-evaluation of antibiotherapy after 48 hours is done on a daily basis but it is rarely documented. Our study shows that the evaluation of the practice of curative antibiotic therapy is useful even in a specialized setting. It reveals our weaknesses and allows us to correct them.

Antibiotic therapy was a probabilistic prescription in 155 (91.18%) and documented on the basis of susceptibility testing in 15 cases (8.82%). In our study, the majority of our patients received monotherapy (54.70%). These results are very similar to the data from available sources. Indeed, several authors had found a monotherapy in 34% to 96% according to studies [2, 3, 8, 14, 15, 16, and 19]. But antibiotics associations were not insignificant. Antibiotics associations represented 45.30% of our work like Mechkour *et al* [28]. (72%), Dia *et al* [17]. (66%), Asseray *et al* (27%) and Patry *et al* (49%) [20, 22]. In our series, the mostly prescribed groups of antibiotics were β-lactams 55.43%, imidazoles 16, 5% and macrolides 13.9%. Dia *et al* found β-lactam in 48%, 23% macrolides and sulfonamides in 06% [17]. Meanwhile Lakhe found the β-lactam antibiotics (50%) and fluoroquinolones (23.3%) [3]. In the series of Goulet *et al* [18], β-lactam antibiotics were prescribed in 60%, followed by 32.5% fluoroquinolones. In the study of Patry *et al* [22], β-lactam represented 52.4% of prescriptions of antibiotics and fluoroquinolones 18.5%. In the study of Affolabi *et al* [2], β-lactams prescriptions represented 44.4% of imidazole 13.4% and 13.4% fluoroquinolones. In the study of European surveillance project on antibiotic consumption, Vander Stichele *et al* [29]. noted that in the 15 European countries where the study was conducted, the mostly prescribed antibiotics groups were β-lactams and fluoroquinolones. This can be explained by the excellent bioavailability and wide spectrum of that class of drug which facilitate their prescription. The three mostly used molecules were ceftriaxone in 27.7%, amoxicillin clavulanic acid in 17.2%, 15.4% metronidazole; unlike Lakhe who found ciprofloxacin (22%) followed by amoxicillin-clavulanic acid (19.3%) [3], and ceftriaxone (15.3%). The sale of these generic molecules may explain the widespread use of cephalosporins in our hospitals in recent years. According to Kallel *et al* [30], the antibiotic therapy was curative in 44% of cases; the requirements were not justified in 30.7%; the most commonly used antibiotics were gentamicin, metronidazole and cefotaxime. Regarding antibiotic combinations, it was a combination therapy in 54 cases (70.12%) and triple therapy in 23 cases (29.87%) whereas Wang *et al* [15]. shown that a total of 55.0% of the antibiotic prescriptions were for antibiotic combination therapy with 2 or more agents In our study, the most commonly used antibiotic combinations were: amoxicillin-clavulanic acid-spiramycin (37.66%), ceftriaxone, metronidazole (11.7%) and ceftriaxone-metronidazole-gentamicin (10.4%). In the work of Dosso [31], the most predominant association was β-lactam-aminoglycoside (34.5%) followed by cotrimoxazole, metronidazole (22.5%).

The quality of the prescription in our study is deemed appropriate 127 times (74.7%), 30 times questionable (17.7%) and unacceptable 13 times (7.6%). In a total of 48 primary health care facilities in China, antibiotics were included in 52.9% of the outpatient visit prescription records: of these, only 39.4% were prescribed properly. Of the inpatients, 77.5% received antibiotic therapy: of these, only 24.6% were prescribed properly [15].

Of the 267 antibiotic prescriptions we found, prescriptions based molecules were appropriate in 97.37% of cases. The dosages were adequate in the majority of prescriptions (90.63%). The routes of administration were observed for almost all molecules (94.00%). Intravenous route represented 186 cases (69.66%), the oral route 66 cases (24.72%) and 15 cases of intramuscular route (5.61%). The wide use of the intravenous route could be explained by the fact that the clinic of infectious diseases is a reference service for the care of

patients living with HIV who are admitted for severe infections at an advanced stage of immunosuppression. The rate of administration was respected on the majority of prescriptions (98.87%). On the contrary, the duration of prescriptions based on molecules was not appropriate in 119 cases on the 267 (44.56%). According to Mechkour *et al* [28], doses were consistent in 94% of cases, administration rhythm in 97% of cases. Among 67 prescribed antibiotics, 39% were administered orally and 60% intravenously. The duration of treatment was consistent with recommendations in 94% of cases. According to Dupont [32], the dose was normal in 92 cases (92%), sufficient duration in 58 cases (59%) and too long 25 times (26%) in excess of more than 48 hours the time recommended in the recommendations. The route and rate of administration were adequate in 100% of cases. Goulet *et al* found that the route of administration of antibiotics was appropriate in all cases and the rate of improper administration in only 1% of cases [18]. The majority of prescriptions were made by specializing doctors (61.80%). According to Asseray *et al* [20], the most common requirements were made by senior physicians (30%) and interns (13%). It is clear from our study that 74.7% of antibiotic prescription is broadly consistent with recommendations force which is also found in the literature of Mechkour *et al* [28]. According to him, the choice of antibiotic molecules was in line with the recommendations for 67% of antibiotics. According to Dia *et al* [17], 62.7% of curative antibiotic prescriptions were justified and appropriate. Meanwhile Lakhe [3], found that 51% of prescriptions were appropriate and almost 1/3 of the requirements (32.9%) were inappropriate. The reason was the lack of standards. These rates vary between 30.7% and 57.4% according to several authors [3, 24, 23, 30 and 33]. At the Emergencies reception Service of the University Hospital of Nice, a study conducted by Roger *et al* [19]. showed that in the absence of an available reference, antibiotic therapy was inadequate in 32% of cases, regardless of the diagnosis. In the study by Goulet *et al* [18]. The rate of adequate prescriptions increased from 25 to 60% (p = 0.01) whereas the indication of antibiotic therapy was present in the recommendations. Martinez *et al* have generally found 52.3% of first line treatment compliance [21]. The causes of non-compliance were extremely diverse, but they consisted in the use of too broad spectrum of antibiotic therapy, especially in combination. This was due to ignorance by prescribers access to the guidelines via the Internet [21]. In the series of Gennai *et al* [25], the appropriateness of antibiotic prescriptions was significantly linked to a single factor: the fact that antibiotics use if only guided by the personal knowledge of the prescriber. However, the existence of a framework applicable to the clinical situation did not improve the relevance of prescriptions (p = 0.52). Dupont *et al* found the choice of clavulanic questionable or unacceptable amoxicillin-acid in 27% of prescriptions [32]. Antibiotic prescription was appropriate for the site of infection and the primary diagnosis in most cases but can be improved. Regarding the quality of prescription depending on the dosage, route of administration, the rate and duration of treatment, mismatches may haves everal explanations such as repeated changes of antibiotics with high cumulative duration, absence of daily revaluation of antibiotic therapy. The passive diffusion as only recommendation does not ensure the change of the behavior of prescribers but active distribution. Initiation of exchange meetings [31], and adherence to the proposals have a significant influence on the state of knowledge of practitioners and therefore on the quality of antibiotic prescriptions. David Ouakine *et al* [26, 34]. were able to show in two studies that this intervention was effective since the rate of adapted prescriptions was improving significantly, from 47 to 59% (p <0.001). A survey on the use of medical reference guidelines by clinicians stressed the need

of guidelines by prescribers. The evaluation of prescription practices and the audit follow up with iterative revaluations however seem to be an important component of effective control policy of antibiotics in the hospital. This assessment is both a membership indicator and an educational tool that helps maintain a constant awareness of prescribers in the use of guidelines [7]. Only 15.9% of initial antibiotic treatment patients were evaluated at the end of the 48th hour. While Mechkour *et al* found 66% of antibiotic reassessed at 48-72 hours [28]. This could be explained by the fact that treatment changes are not often mentioned in the files. Of the 170 patients, only 60 (35.5%) had received antibiotic modification. This result is similar to Lakhe 3 in 32 cases on a total of 101. As per Goulet *et al* [18], antibiotic therapy was modified in 8 cases out of 30. Martinez *et al* found that more than half of first-line therapy (55.3%) had been modified after a re-evaluation at 48-72 hours [21]. This revaluation at 48-72 hours is a good practice for appropriate antibiotic use aiming at assessing the effectiveness of treatment, adapting the antibiotic treatment to the results of susceptibility testing, and especially helping to choose antibiotics with narrower spectrum [24]. The need for continued antibiotic therapy should be evaluated daily to avoid too short or too long administration. Also, these treatment changes may have several explanations, namely co morbidities, clinical failures and / or microbiological, non-use of well codified recommendations, the difficulty of obtaining a microbiological documentation. In our series, 83.33% of antibiotics changes consisted in spectrum enlargements.

Evolution
The average time of patients' hospitalization was 14 ± 11 days with extremes ranging from 0 to 57 days. Lakhe 3 found an average duration of 11.4 ± 29.6 days with extremes ranging from 1 to 36 days. Gennai *et al* found an average of hospitalization of 19.8 days with a median of 10 days [25]. Healing was the rule (69.2%) regardless of the quality of prescription in our study. There was no statistically significant difference when comparing the evolution by sex and the evolution of patients based on the quality of antibiotic prescription. These results are similar to those found by Lakhe 90% [3], and by Roger *et al* 82% [19].

Constraints
The main constraint of our work was the lack of bacteriological sampling performed in many patients, often for financial reasons, thus limiting the use of our data.

Conclusion
In Senegal and even in West Africa, few studies evaluating professional practices in health facilities have been conducted. Antibiotherapy is a widespread practice that needs to be supervised even in specialized facilities. Compliance rate of antibiotic prescription to national recommendations was 74.7% in this infectious disease department of Dakar mainly due to unfulfilled treatment times and the lack of evaluation of antibiotic therapy after 48 hours of administration. Quality of antibiotic prescription with curative intent in this specialized clinic of infectious diseases is still good though it could be improved particularly by strengthening the quality of the prescription, with regular training of health service providers and also by a better promotion of the use of antibiotics guide nationwide. However, this guide must be regularly revised to be in line with the local bacterial ecology.

Acknowlegdments

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