



Antibiotherapy during Bacterial Infection in Chronic Kidney Disease Patient Hospitalized in Nephrology of National Hospital Donka

Alpha Boubacar Bah*, Mamadou Saliou Balde, Fousseny Diakité, Moussa Traoré, Amadou Yaya Diallo, N'da Adopo Akédé Marie-Louise, Ibrahima Cherif, Mohamed Lamine Kaba, Alpha Oumar Bah

Nephrology-Hemodialysis Department, National Hospital Donka, Conakry, Guinea

Email: *bahalpha427@gmail.com

How to cite this paper: Bah, A.B., Balde, M.S., Diakité, F., Traoré, M., Diallo, A.Y., Marie-Louise, N.A.A., Cherif, I., Kaba, M.L. and Bah, A.O. (2023) Antibiotherapy during Bacterial Infection in Chronic Kidney Disease Patient Hospitalized in Nephrology of National Hospital Donka. *Open Access Library Journal*, 10: e10560.

<https://doi.org/10.4236/oalib.1110560>

Received: July 30, 2023

Accepted: November 20, 2023

Published: November 23, 2023

Copyright © 2023 by author(s) and Open Access Library Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

The research on infectious pathologies and antibiotic treatments has undergone rapid development, marked by the emergence of new pathogens and by the evolution of resistance to antibiotics despite the marketing of new agent. The aim of this study was to evaluate the use of antibiotics in bacterial infection in our context. The aim of this study was to evaluate the use of antibiotics in bacterial infection in our context. We conducted a descriptive study lasting 6 months from January 2 to June 30, 2019. We included all hospitalized patient who presented signs of infection, subjected to antibiotic therapy. We research the frequency, the socio-demographic parameter, clinical and biological parameters. During the study period, we had 162 hospitalized patients, only 66 (41%) presented with an infectious syndrome. The mean age was 45 ± 3.5 years. There was a predominance of men 35 (53.03%). According to clinical parameters, the mean temperature was $38.28 (+/- 1.022)^{\circ}\text{C}$, chills, sweat, dyspnea and meningeal syndrome. The mean duration of antibiotic therapy was 14 ± 7 days with extremes [3 to 21 days]. The biology was characterized by polynuclear neutrophilic leukocytosis in 37 (75.51%), an inflammatory syndrome with an elevated CRP in 37 patients with a mean of 24 ± 12 mg/L. Antibiotic are regularly prescribed for bacterial infections in chronic renal failure. Bacterial resistance represents a very high risk factor for mortality in CKD patient because of the associated co-morbidities.

Subject Areas

Nephrology

Keywords

Antibiotic, Bacterial Infection, Chronic Kidney Disease, Donka

1. Introduction

A bacterial infection is a proliferation resulting in cellular, tissue or general reactions, most often resulting in an inflammatory syndrome. It is the result of complex interaction between the body defense mechanism, the site and the bacteria [1]. Antibiotics are chemical or semi-synthetic substances produced by microorganisms, and have the power to oppose the multiplication of bacteria by destroying them or by inhibiting their multiplication [2]. The use of one or more antibiotic constitute antibiotherapy. Bacterial infection represents a major cause of morbidity and mortality (second cause after cardiovascular disease) in patients on chronic hemodialysis [3].

All infections combined, the most frequently affected site are the urinary tract, respiratory system, skin and subcutaneous tissue. The germs most often responsible are gram-negative bacilli with Enterobacteriaceae (*Escherichia coli*, *Klebsiella pneumoniae*...) then gram-positive cocci (*Streptococcus pneumoniae*, *Staphylococcus aureus* and *Enterococcus*) [4].

The incidence of glomerulonephritis associated with bacterial infection in adults is estimated at 2 and 0.3 cases/100,000 person-years in developing and developed countries [5]. In Morocco, in a retrospective study carried out in 2012 at Al Ghassani provincial hospital in Fez, the prevalence of infection linked to central venous catheters in hemodialysis subjects was 1.23% with an average age of 46 years, after a catheter placement of 48 days [6].

Research on infectious pathologies and antibiotic treatments has evolved rapidly, marked on the one hand by the emergence of new pathogen, on the other hand by the evolution of resistance to antibiotics despite the marketing of new molecule [7]. In Africa, 20% to 50% of antibiotic treatments are quantitatively or qualitatively inappropriate and this concerns both antibio-prophylaxis and curative antibiotic, whether or not there has been bacterial identification [8]. If the current trend continues, doctors could find themselves in the next few years, helpless in the face of certain infectious diseases [9]. The aim of the study was to identify the bacterial germ in our department and evaluate the bacterial sensitivity to antibiotic.

2. Methods

We did a descriptive study in 6 months from January 2 to June 30, 2019. We included all the patient hospitalized in the nephrology department who presented infectious signs, subjected to antibiotherapy. We determined the frequency of infections during the study period, socio-demographic parameters (age, sex, level of education) was evaluated; clinical parameters (length of hospitalization, signs of infection); laboratory parameters of the infection were full blood count, CRP; bacteriology (blood culture, cytobacteriological examination of urine with antibiogram), were studied. We researched prescribed antibiotics and assessed their effectiveness. This study was carried out under the supervision of the Nephrology department. All patients were informed of the benefit of this study

and its confidentiality. We had verbal consent from patient or their caregivers during the study period.

3. Results

During the study period, we had 162 hospitalized patients 66 (41%) presented with an infectious syndrome from January 2 to June 30, 2019. The mean age of the patients was 45 ± 3.5 years. There was a male predominance 35 (53.03%) with a sex ratio (M/F) = 1.13. According to clinical parameters: the mean temperature was $38.28 (+/- 1.022)^{\circ}\text{C}$, chills, sweat, dyspnea and meningeal syndrome. The functional signs were: pain, redness, induration, a purulent collection, urination burns, cough with sputum, diarrhea and earache. The mean duration of antibiotic therapy was 14 ± 7 days with extremes [3 to 21 day]. The biology was characterized by polynuclear neutrophilic leukocytosis in 37 (75.51%), an inflammatory syndrome with an elevated CRP in 37 patients with a mean of 24 ± 12 mg/L. The main infections were: infectious lung disease, urinary tract infection, salmonellosis, hemodialysis catheter infection, ENT infection. Cytological examination showed 27 (40%) positive culture including Gram negative Bacillus 5 (10.87%), Gram positive Bacillus 3 (6.52%). The main organisms isolated were: see **Table 1**.

We had a favorable outcome during antibiotic therapy in 50 (75.76%) and an unfavorable outcome in 16 (24.24%).

4. Discussion

Empirical treatment of a suspected bacterial infection should be done on the pathogen, the site of infection, the local antimicrobial resistance and according to the disease history of each patient. Antibiotic therapy should be adjusted according to the result of the antibiogram and the isolated germ. Antimicrobial resistance is recognized as a major public health problem. It is generally associated

Table 1. Distribution by identified germ (N = 46).

| Identified Germ | Number | Percentage |
|------------------------------|--------|------------|
| Gram negative bacillus | 5 | 10.87% |
| Gram positive bacillus | 3 | 6.52% |
| <i>Escherichia coli</i> | 10 | 21.74% |
| <i>Staphylococcus aureus</i> | 5 | 10.87% |
| <i>Klebsiella pneumoniae</i> | 3 | 6.52% |
| <i>Salmonella</i> | 18 | 39.13% |
| <i>Shigella</i> | 2 | 4.34% |
| Total | 46 | 100% |

with an overuse of antibiotics and makes it difficult to manage with empiric antibiotic therapy by clinicians, especially when there is antimicrobial resistance to the culture [10]. We have great difficulty in managing infections in our settings, especially when it comes to growing germs and waiting for the DST. Usually patients go to other services where the management of the infection has been poorly codified and the antibiotic therapy already started a long time ago, we receive them in the area of infection associated with end-stage renal failure. In this situation where the immune system is very weakened because of their uremic state, We encounter resistance associated with infections.

Urinary tract infection in renal failure is, from the outset, a complicated urinary tract infection requiring specific diagnostic and therapeutic management [11]. Urinary tract infection is often complicated and requires early and precise diagnosis and appropriate management. It can lead to general complications, such as urinary-onset sepsis [12]. Empiric antibiotic therapy has been the most widely used ciprofloxacin 500 mg until the results of the antibiogram and generally in case of resistance we use the carbapemes for 7 to 15 days until sterilization of the site of infection. Hemodialysis catheters are heavily used in our settings, given the delay in making arteriovenous fistula, chronic hemodialysis patients have catheters that are often infected. Double antibiotic therapy based on ceftriaxone 1 g combined with ciprofloxacin 500 mg was used until the antibiogram was obtained and then adapted according to the sensitivity of the germ. The management of ENT infections were generally done with empiric antibiotics containing aminoside for a treatment of 5 to 10 days, we had not encountered cases of resistance

The use of traditional antibiotics can be a huge source of antibiotic resistance. Infections are major risk factors for morbidity and mortality in chronic renal failure. Prevention occupies a very important place. This prevention must be centered on the prevention of nosocomial infections with regular disinfection of hospital services, the rigorous application of the prevention of infections in hemodialysis.

5. Conclusion

Antibiotics are regularly prescribed for bacterial infections in nephrology. Bacterial resistance represents a very high risk factor for mortality in CRF due to the associated comorbidities. The practitioner caring for patients with CRF must be familiar with the antimicrobial resistance encountered in order to be able to make the right choice of antibiotics. Bacterial culture should always be performed and then properly adapt the prescription. New antibiotics with low antimicrobial resistance must be adapted to our practices for better care of our patients.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] Bone, R.C., Fein, A.M., Balk, R.A., et al. (1992) Definitions for Sepsis and Organ Failure and Guidelines for the Use of Innovative Therapies in Sepsis. *ACCP/SCCM Consensus Conference*, **101**, 1644-1655. <https://doi.org/10.1378/chest.101.6.1644>
- [2] Bahri, M. and Zaoui, F. (2017) Exploration des infections bactériennes au niveau du service de Néphrologie du CHU de Tlemcen, Université Abou Bekr Belkaid, Faculté de Médecine.
- [3] SFHH (2005) Surveillance épidémiologique et signalement des infections en hémodialyse. *Hygiènes*, **XIII**, 90-93.
- [4] Beziaud, N., Pavese, P. and Barnoud, D. (2009) Infections bactériennes en soins palliatifs: Antibiothérapies et limitations thérapeutiques. *La Presse Médicale*, **38**, 935-944. <https://doi.org/10.1016/j.lpm.2008.10.013>
- [5] Sakthirajan, R., Jeyachandran, D. and Nagarajan, M. (2018) Crescentic Infection Related Glomerulonephritis in Adult and Its Outcome. *Saudi Journal of Kidney Diseases and Transplantation*, **29**, 623-629.
- [6] Ikram, D. (2012) Infections chez les hémodialysés chroniques. Application hôpital Al Ghassanide Fès-Maroc, Thèse de doctorat en médecine, n°0026/12 Université Sidi Mohammed Ben Abdellah, Fès.
- [7] Cohen, R. and Bingen, E. (1992) Critères de choix d'un antibiotique. Flammarion, 144-148.
- [8] Collège des Universités des Maladies Infectieuses (2003) Le POPI Guide traitement Références pour une bonne pratique médicale 8^{ème} édition Paris, 252.
- [9] Deboxker, Y. and Mouton, Y (2009). Critères de choix d'un antibiotique. *Encycl. Med, chir. Paris, Thérapeutique*, 25006, B102—1988. De Doctorat à la faculté de Médecine pharmaco-ondoto-stomatologie-2009.
- [10] Pobiega, M., Wójkowska-Mach, J., Chmielarczyk, A., Romaniszyn, D., Adamski, P., Heczko, P.B., Gryglewska, B. and Grodzicki, T. (2013) Molecular characterization and drug resistance of Escherichia coli strains isolated from long-term care facilities residents with urinary tract infections in Cracow, Poland. *Medical Science Monitor*, **19**, 317-326. <https://doi.org/10.12659/MSM.883898>
- [11] Google Scholar (2008) Infections urinaires de l'adulte et de l'enfant, les recommandations 2008 de l'AFSSAPS.
- [12] Bennsman, A. Infection de l'appareil urinaire chez l'enfant. Meyrier Alain des infections de l'appareil urinaire préface du Pr. François Vachon. Editions médicales de Merck Sharp et Dohme-Chibret.