

Prescriptions of antibiotics in gynecological and obstetric surgery at the maternity ward of the Regional Hospital Center (CHR) in Niamey.

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ABSTRACT

Objectives: To take stock of the prescription of antibiotics in gynecological and obstetric surgery at the maternity ward of the CHR poudrière in Niamey.

Patients and method: This is a prospective descriptive study running from March 1st to August 31, 2021 at the maternity ward of the CHR poudrière in Niamey. All patients who had undergone gynecological or obstetrical surgery with antibiotic prophylaxis or curative antibiotic therapy were included in the study. The variables studied were: Age, level of education, marital status, profession of the patient, history, modality and type of surgical interventions, type of anesthesia performed, duration of the intervention, postoperative monitoring, complications, methods of prescribing antibiotic prophylaxis and curative antibiotic therapy, associated treatment, and length of hospitalization. The data were entered and analyzed using Microsoft 2016 and Sphinx.v5 software.

Results: We recorded 677 patients, 563 of whom had benefited from prophylactic antibiotics, with a frequency of 83.16%, and 114 from curative antibiotic therapy, with a frequency of 16.84%. The average age was 28.59 years with extremes of 15 and 70 years. The majority of surgical interventions were performed urgently with 83.31% (n=564) and belonged to the clean surgery class in 83.16% (n=563) of cases. The average duration of surgical procedures was 40.66 minutes. The incidence of postoperative infection was 6.50% (n=47). Ceftriaxone was the molecule most used in antibiotic prophylaxis in 96.63% (n=544) of cases and in antibiotic therapy in 64.55% (n=102). For antibiotic prophylaxis, antibiotics were administered after cord clamping in all patients who underwent cesarean section and at induction in 84.10% (n=37) of cases in other surgical procedures. The duration of antibiotic prophylaxis was a maximum of 48 hours in 3.91% (n=22) and greater than 14 days of antibiotic therapy in 44.06% (n=63) of cases. The average length of stay was 3.8 days with a mortality rate of 1.18% (n=8).

Conclusion: Although the effectiveness of antibiotic prophylaxis and antibiotic therapy has been proven in gynecological and obstetric surgery, certain points should be reviewed in order to limit the occurrence of possible complications linked to their poor practices.

Keywords: Antibiotics, Surgery, Gynecology - obstetrics, Niamey CHR, Niger.

Introduction: The evolution of infectious diseases has been revolutionized in half a century by the discovery of antibiotics; major tools in the fight against infection. Certain infections that were once incurable are no longer so today [1]. The use of antibiotics both curatively and preventively, however, requires a lot of rigor, because their improper handling can increase their disadvantages, notably the occurrence of side effects, the risk of unnecessary expenses, and especially the spread of bacterial resistance. In a hospital environment, the disadvantages of antibiotic therapy are increased because the prescription rate is high, and the frequency of multi-resistant germs is higher [1]. The objective of this study is to take stock of the prescription of antibiotics in gynecological and obstetric surgery at the Niamey CHR maternity ward.

Patients and method: This is a prospective descriptive study running from March 1st to August 31, 2021 at the CHR poudrière maternity ward of Niamey; i.e. a duration of 6 months. All patients who had undergone gynecological or obstetrical surgery with antibiotic prophylaxis or curative antibiotic therapy were included in the study. The variables studied were: Age, level of education, marital status, profession of the patient, history, modality and type of surgical interventions, type of anesthesia performed, duration of the intervention, postoperative monitoring, complications, methods of prescribing antibiotic prophylaxis and curative antibiotic therapy, associated treatment, and length of hospitalization. The data were entered and analyzed using Microsoft 2016 and Sphinx.v5 software.

Results: During the period of our study, 677 patients were collected, 563 of whom had benefited from prophylactic antibiotics, with a frequency of 83.16%, and 114 from curative antibiotic therapy, with a frequency of 16.84%. The average age was 28.59 years with extremes of 15 and 70 years; The age group of 21 to 30 years was the most represented with 48% (n=325) of cases. Hypertension and diabetes were the main chronic pathologies with respectively 7.68% (n=52) and 2.95% (n=20) of cases. The majority of surgical interventions were performed urgently in 83.31% (n=564) and belonged to the clean surgery class in 83.16% (n=563) of cases. (Table I) Caesarean section represented the main surgical intervention performed in 87.44% (n=592); followed by GEU treatment with 5.17% (n=35) of cases. (Table II)

Table I: Distribution of patients according to the class of surgical procedures performed

Class	Effective	Percentage (%)
Clean surgery	563	83.16
Contaminated clean surgery	74	10.93
Contaminated surgery	39	5.76
Dirty surgery	1	0.15
Total	677	100

Table II: Distribution of patients according to the nature of the surgery

Nature of surgery	Effective	Percentage (%)
Caesarean section	592	87.44
GEU cure	35	5.17
Hysterectomy	18	2.66
Promontofixation	8	1.18
Ovarian cystectomy	6	0.88
Myomectomy	6	0.88
Perineorrhaphy	4	0.59
Cystocele cure	2	0.30
Evisceration	2	0.30
Breast lumpectomy	2	0.30
Hernia treatment	1	0.15
Oophorectomy	1	0.15
Total	677	100

Spinal anesthesia was the most practiced technique in 88.33% (n=598) of our patients. The average duration of the interventions was 40.66 minutes ± 10.42 with extremes of 20 minutes and 110 minutes. The incidence of postoperative infection was 6.50% (n=47). Wall suppuration was the main complication found postoperatively in 6.05% (n=41) of cases. (Figure n°1)

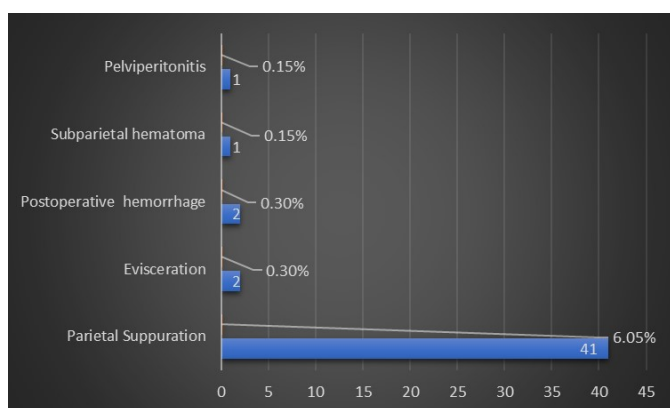


Figure n° 1: Distribution of patients according to post-operative complications

Ceftriaxone was the molecule most used in antibiotic prophylaxis in 96.63% (n=544) of cases and in antibiotic therapy in 64.55% (n=102). (Table III) Ceftriaxone and amoxicillin/clavulanic acid were

the main antibiotics used in curative antibiotic therapy with respectively 71.33% (n=102) and 17.48% (n=25) of cases. (Table IV) The duration of antibiotic prophylaxis was a maximum of 48 hours in 3.91% (n=22) and greater than 14 days of antibiotic therapy in 44.06% (n=63) of cases. (Table V)

Table III: Distribution of patients according to antibiotics used in antibiotic prophylaxis

Molecule	Dose (gram)	Effective	Percentage (%)
Ceftriaxone	2g	544	96.63
Ampicillin/Sulbactam	1.5g	15	2.66
Ampicillin	2g	4	0.71
Total		563	100

Table IV: Distribution of patients according to antibiotics used in curative antibiotic therapy

Molecule	Dose (g/day)	Effective	Percentage (%)
IV			
Ceftriaxone	2g	102	71.33
Ampicillin/sulbactam	3g	11	7.69
Imipenem	1g	2	1.40
Total		115	80.42
Oral			
Amoxicillin/clavulanic acid	2g	25	17.48
Cloxacillin	3g	3	2.10
Total		28	19.58
Total		143	100

Table V: Distribution of patients according to length of stay

Length of stay (day)	Effective	Percentage (%)
2 - 5	568	83.90
6 - 10	101	14.92
> 10	8	1.18
Total	677	100

The average length of stay was 3.8 ± 1.3 with extremes ranging from 2 to 50 days. The mortality rate was 1.18% (n=8).

Discussions: During the period of our study, 667 patients had undergone gynecological and obstetric surgical procedures; the frequency of antibiotic prophylaxis was 83.16%. **Hayett H et al.** in Tunisia in 2015 found a frequency of 74% for antibiotic prophylaxis [2]. The frequency of curative antibiotic therapy was 16.84% in our series. **Anas E et al.** in Morocco in 2015 found a frequency of 83.16% [3]. The average age of our patients was 28.59 years with extremes of 15 and 70 years; This average age is close to that obtained by **Mpogoro FJ et al.** in Tanzania in 2014 which found 26.80 years. [4] On the other hand, **Jean Dupont KN et al.** in Cameroon in 2013 and **Hayett H et al.** found in their series respective average ages of 35.4 years and 55.26 years. [2,5] In our series, 83.31% of surgical interventions were performed urgently. **Jean Dupont KN et al., Hayett H et al.** had reported that in respectively 58.47% and 32.7% of cases the interventions were carried out urgently. **Mpogoro FJ et al.** found that in 92.90% of cases interventions were carried out urgently. [2,4,5] In our series, 83.16% of the surgical interventions performed belonged to the class of clean surgeries; our result is superior to those found by **Jean Dupont**

KN et al., Hayett H et al. which had found 27.70% and 64.7% respectively. [2,5] Cesarean section was the main surgical intervention performed with 87.44% of cases. **Jean Dupont KN et al., Mpogoro FJ et al.** and **Yobi AS et al.** in Burkina-Faso in 2015 found respectively in their series 27.96%, 23.80% and 36.1% of cesarean sections performed. [4-6] Spinal anesthesia was the most commonly performed technique in our study with 88.33% of cases; **Jean Dupont KN et al.** and **Mpogoro FJ et al.** had found 78.26% and 95.65% cases respectively in their series. [4,5] The average duration of surgical interventions is 40.66 minutes ± 10.42 in our series, our result is similar to that found by **Yobi AS et al.** which was 46.60 mins. [6] In our series, 82.28% of surgical interventions lasted between 30 and 60 minutes; the same is true for **Mpogoro FJ et al.** who found 83.76% of interventions with a duration of between 30 and 60 minutes. On the other hand, **Yobi AS et al.** found 72.90% of interventions lasting between 30 and 60 minutes. This could be explained by the fact that the duration of interventions depends on several factors including the nature of the intervention and the occurrence of possible complications. However, the longer the procedure, the higher the risk of infection. [4, 6,7]. The incidence of postoperative infections is 6.50% in our series. This result is close to that of **Mpogoro FJ et al.** who found 5.90% cases of postoperative infections in their series. **Jean Dupont KN et al., Yobi AS et al.** found respectively 1.4% and 3.50% cases of postoperative infections in their series. On the other hand, **Hentchoya R et al.** in Cameroon in 2007 found 23.2% cases of postoperative infections in their series. This difference may be the fact that intraoperative antibiotic prophylaxis is increasingly known and practiced rigorously by practitioners. [4 -7] In our series, the molecule most frequently used

in antibiotic prophylaxis was ceftriaxone (3rd generation cephalosporin) in 96.63% of cases. **Traoré AI et al.** in Burkina-Faso in 2012 found that ceftriaxone was the molecule most used in antibiotic prophylaxis in 69.10% of cases. On the other hand, **Jean Dupont KN et al.**, **Hayett H et al.** found in their series that the most used molecule was cefazolin with 99% and 60% respectively. This could be explained by the fact that 3rd generation cephalosporins, notably ceftriaxone, are more accessible in our country. [2,5,8] During cesarean sections, antibiotics were administered after clamping the umbilical cord in all patients in our series and for surgical procedures other than cesarean sections 84.10% antibiotics were administered at induction. This result is similar to that of **Hayett H et al.** who also found that 84% of antibiotics were administered at induction during antibiotic prophylaxis; This could be explained by the fact that there is no consensus on the start of antibiotic prophylaxis. The time of administration of the antibiotic strongly influences the plasma concentration of antibiotics at the time of the incision and throughout the procedure. However, according to the new recommendations, antibiotics should be administered 30 minutes before the incision, even during cesarean sections. [2,9] In our series the duration of antibiotic prophylaxis was 48 hours maximum in 3.91% of patients. **Traoré IA et al.** found in their series 25% maximum duration of 48 hours for antibiotic prophylaxis. On the other hand, **Naija H et al.** in Tunisia in 2009 reported that in 99% of cases antibiotic prophylaxis lasted a maximum of 48 hours. This could be explained by the fact that most practitioners believe that the longer the prophylaxis is prolonged, the more the patient is protected. This attitude results from the confusion that exists between antibiotic prophylaxis and antibiotic therapy. Also, the precarious aseptic conditions in our operating theaters could explain this difference. [8,10] In our series, ceftriaxone and amoxicillin-clavulanic acid are the main antibiotics used in curative antibiotic therapy in 71.33% and 17.48% of cases, respectively. **Anass E et al.** found in their series that the main molecule used in antibiotic therapy is amoxicillin-clavulanic acid followed by ceftriaxone in 31.40% and 8.60% of cases respectively. [3] **Borderan GC et al.** in France in 2008 found in their series that the main antibiotics used in antibiotic therapy were amoxicillin clavulanic acid followed by fluoroquinolones in 41.54% and 15.38% of cases respectively. Indeed, in our study, the prescription of antibiotics is done in a probabilistic way and this is explained by the low socioeconomic level of our patients and also by the lack of technical facilities essential for bacteriological examinations in the said center. [11] The average length of stay was 3.8 days \pm 1.3 with extremes of 2 and 50 days in our series; **Yobi AS et al.** found an average duration of 23.8 days. This could be explained by the fact that in our series the treatment of the majority of postoperative infections was done on an outpatient basis. [6] The mortality rate in our series was 1.18%. Our results are similar to those of **Biccard BM et al.** in Africa in 2018 who found a mortality rate of 1.1% in their series. **Chaibou MS et al.** in Niger had reported a mortality rate of 2.2%. None of the deaths were linked to infection in our series. [12,13]

Conclusion: The use of antibiotics remains a sensitive subject. Both prophylactically and curatively, their uses require compliance with a few rules and principles in order to reach a certain threshold of effectiveness while avoiding possible complications. Thus, at the end of our study, we clearly deduce the effectiveness of antibiotic prophylaxis and curative antibiotic therapy. However, certain as-

pects, among others, the maximum duration and the start of antibiotic prophylaxis, the choice of antibiotics in curative antibiotic therapy, etc., should be reviewed in order to comply as closely as possible with established recommendations and to reduce the risk of emergence of resistant bacterial strains. To do this, efforts must be redeployed to implement measures to optimize the adherence of the health professionals concerned to national and international standards, and studies on bacterial ecology in our operating theaters should be carried out in order to identify the sensitivity profile of bacteria.

Conflict of interest: none

References

1. Sandou I, Kam KL, Batino AD et al . Analysis of the prescription of antibiotics in the pediatric department of the Yalgado Ouedraogo national hospital center in Ouagadougou. *Pediatric publications in Burkina Faso*. 2000; 21P.
2. Hayett H, Latifa M, Mohamed HB et al. Evaluation of surgical antibiotic prophylaxis practices in a University Hospital in Central Tunisia. *Pan Afr Med Journal*, 2018. 30:191
3. Anass E, Mostafa R, Naoufal C et al . Evaluation of antibiotic prescriptions in the emergency department of the Mohammed V Military Instruction Hospital (HMIMV). *Pan Afr Med Journal*, 2016; 25:162P.
4. Mpogoro FJ, Mshana SE, Mariam MM et al. Incidence and predictors of surgical site infections following caesarean sections at Bugando Medical Centre, Mwanza, Tanzania. *Antimicrobial Resistance and Infection control*. 2014 ; 3:25P.
5. Jean Dupont KN, Anny N, Motzogo RM et al. Antibiotic prophylaxis in clean and clean contaminated gynecological and obstetric surgeries at the General Hospital of Yaoundé, Cameroon. *Pan Afr Med Journal*, 2014; 19:23P.
6. Yobi AS, Evelyne K, Sibraogo K et al. Postcesarean wall suppurations at the Yalgado Ouedraogo University Hospital Center, Burkina-Faso: epidemiological, clinical, therapeutic and prognostic aspects. *Pan Afr Med Journal*, 2019; 32:35P.
7. Hentchoya R, Moyo SJ, Ela AA et al. Postoperative infectious morbidity in gynecological surgery at Yaoundé University Hospital. *Maternal and child health clinic*. 2007; 4(2):723-731.
8. Traoré IA, Dakouré PWH, Zaré C Et al. Evaluation of knowledge and practices on surgical antibiotic prophylaxis in the city of Bobo-Dioulasso (Burkina-Faso). *SARAF*. 2012; 3:17P.
9. Marc G, Remy G, Claire D-F et al. Antibiotic prophylaxis in surgery and interventional medicine. *SFAR*.2024
10. Naija w, Farhat I, Chemchikh H. Evaluation of antibiotic prophylaxis practices in total hip arthroplasty surgery. *Tun Ortho*. 2009; 2:30P.
11. Borderan CG, Mignot L, Bonnan J et al. Evaluation of curative antibiotic therapies in the orthopedic surgery departments of a CHG. *Medicine and Infectious Diseases*. France. 2010; 40:285-291.
12. Biccard BM, Madiba TE, Kluyts HL et al. Perioperative patient outcomes in the African Surgical Outcomes Study. *Lancet*. 2018; 391: 1589-1598.
13. Chaibou MS, Daddy H, Gagara M et al. Practice of Obstetric Anesthesia for Caesareans in Developing Countries: A prospective Study about 268 Cases. *J Anesth Perioper Care*. 2020 Apr; 1(1): 105