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Post-Caesarean Bacterial Infections at the Reference Health Center of Commune I of Bamako, Mali

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Abstract **Original Research Article**

Caesarean section is not a harmless procedure, as it can be complicated by infections. Postoperative caesarean section infections remain a public health problem because of their high frequency, the cost of treating them and their seriousness. Aim: The aim of this study was to determine the frequency, risk factors and germs responsible for post-caesarean section surgical site infections in the obstetrics and gynaecology department of the commune I referral health centre in Bamako. Materials and methods: We conducted a cross-sectional, descriptive and analytical study over a 12-month period from 1er January to 31 December 2019. All women who underwent caesarean delivery in the department during the study period were included. Results: Out of 9158 deliveries we recorded 1793 caesarean sections, i.e. 19.58%. Among the 1793 cases of caesarean section we recorded 50 cases of surgical site infection or 2.78%. Long labour was the most common infectious risk factor (46%). The germs found were Escherichia coli, staphylococcus aureus, streptococcus agalactiaes, proteus mirabilis and proteus vulgaris. Conclusion: Bacterial infections of the post-caesarean surgical site are frequent in our department. Better antenatal care and adequate monitoring of labour, combined with compliance with infection prevention rules, can help to significantly reduce these post-caesarean complications.

Keywords: Bacterial infection, germ, post-caesarean section, surgical site.

INTRODUCTION

Caesarean section is not a harmless procedure. It can be fraught with complications, including surgical site infection. Postoperative infection remains a major public health problem because of its high frequency, the cost of treatment and its seriousness. The incidence of postoperative surgical site infection (SSI) remains high, ranging from 3% to 24% [2-6]. Although easy to diagnose, the treatment of SSIs is more difficult and more time-consuming, requiring many different therapies. The length of hospital stay is long and inhibits the normal activity of patients and those accompanying them. Given the high frequency of these infections in the literature, we initiated this work for the first time in our department with the aim of understanding their frequency, identifying the risk factors and the germs responsible.

MATERIALS AND METHODS

Our study took place in the maternity ward of the Commune I Reference Health Center, Bamako, Mali. This is a 2nd level Reference facility in the Malian health pyramid. This was a cross-sectional, descriptive and analytical study which took place from 1 January to 31 December 2019, i.e. 12 months. The study population consisted of all patients who underwent a caesarean section in our department. All caesarean sections performed in the department that were complicated by surgical site infection according to the CDC Atlanta definition were included in this study. The data were analysed using SPSS statistical software. The statistical

test used was the chi2 with a significance threshold set at 5%. Informed consent was obtained from the patients prior to data collection. Confidentiality of the data was guaranteed.

RESULTS

Out of 9158 deliveries performed in our department, we recorded1793 caesarean sections, i.e. 19.58%. Among these 1793 cases of caesarean section we recorded 50 cases of surgical site infection or 2.78%.

Table 1: Distribution of patients according to infectious complications

Infectious complications	Number	Frequency (%)
Endometritis	34	68.0
Parietal suppuration	15	30.0
Pelviperitonitis	1	2.0
Total	50	100.0

Table 2: Socio-demographic characteristics

Socio-demographic characteristics	Number	Frequency (%)
Age		
≤ 19	5	10.0
20 à 29	33	66.0
30 à 35	7	14.0
≥ 35	5	10.0
Profession		
Artist	1	2.0
Retailer	5	10.0
Pupil&Student	2	4.0
Civil servant	3	6.0
Housewife	39	78
Level of education		
Primary	8	16.0
Secondary	4	8.0
Superior	2	4.0
Not attending school	36	72.0

Table 3: Breakdown of patients by reason for admission

Reason for Admission	Number	Frequency (%)
Labour	23	46.0
DFP*	1	2.0
Stationary expansion	5	10.0
Genital haemorrhage	7	14.0
HU** excessive	1	2.0
Shoulder presentation	1	2.0
Procidence of cord	1	2.0
RPM*** / Scar uterus	9	18.0
Head office at primigeste	1	2.0
Scar uterus/Limiting pelvis	1	2.0
Total	**50**	**100**

*FDP: Fetopelvic Disproportion, **Uterine height, ***RPM: Premature rupture of membranes

Table 4: Distribution of patients according to infectious risk factors

Infectious risk factors	Number	Frequency (%)
Long working hours (> 12h)	23	46.0
Tinted liquid	10	20.0
Premature rupture of membranes (> 12h)	8	16.0
Duration of caesarean section > 60mn	5	10.0
Intraoperative haemorrhage > 100 0ml	4	8.0

Total	**50**	**100.0**

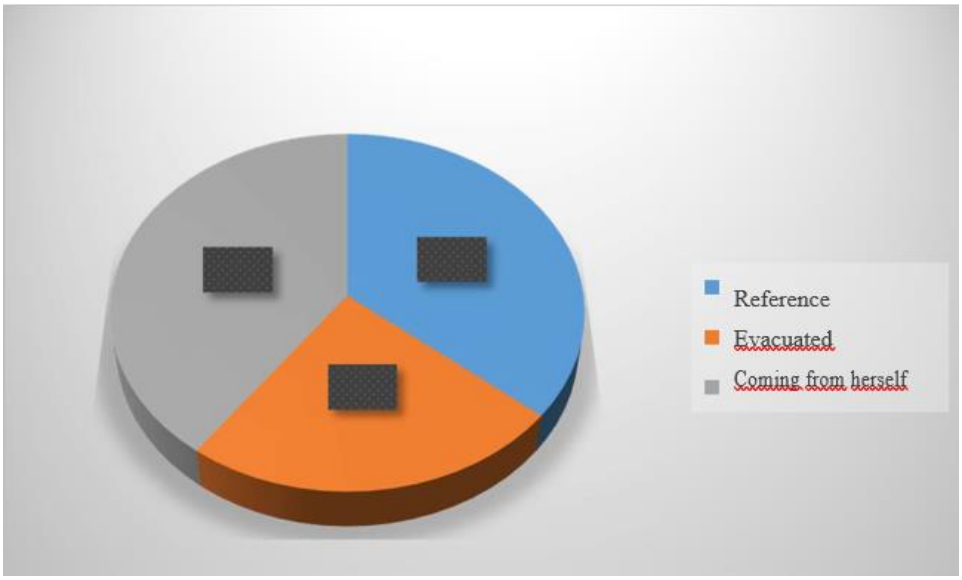

Figure 1: Breakdown of patients by mode of admission

Table 5: Relationship between indications for caesarean section and infectious complications

Caesarean section	**Infectious complications**			
	Endometritis	**Parietal suppuration**	**Pelviperitonitis**	**Total**
AFP *	10(29,42%)	8(53,33%)	0(0%)	18(36%)
RHP **	1(2.94%)	1(6.67%)	0(0%)	2(4%)
PP***	1(2,94%)	0(0%)	0(0%)	1(2%)
Bicatricial uterus	7(20,59%)	2(13,3%)	1(100%)	10(20%)
FDP ****	1(2,94%)	0(0%)	0(0%)	1(2%)
Uterine rupture	1(2.94%)	1(6.67%)	0(0%)	2(4%)
Macrosomia	1(2,94%)	1(6,67%)	0(0%)	2(4%)
Other	12(35,29%)	2(13,33%)	0(0%)	14(28%)
Total	**34**	**15**	**1**	**50(100%)**

Khi2=21,3737 dl=7 P=0,0174

**AFP: Acute foetal distress, **RHP: Retroplacental Haematoma, ***PP: Placenta previa, ****FDP: Fetopelvic Disproportion*

Table 6: Correlation between operator and type of infection

Operators	**Type of infections**			
	Endometritis	**Parietal suppuration**	**Pelviperitonitis**	**Total**
General practitioner	28(82%)	10(10%)	1(100%)	39(78%)
Gynaecologist obstetrician	6(18%)	5(33%)	0(0%)	11(22%)
Total	**34**	**15**	**1**	**50(100%)**

Chi2=124616 dl=1 P=0.00

Table 7: Breakdown of germs found on bacteriological examination of pus

Germs found	**Number**
Escherichia coli	10
Staphylococcus aureus	6
Streptococcus agalactiae	5
Proteus mirabilis	4
Proteus vulgaris	3

DISCUSSION

Our study reported 50 cases of infectious complications, i.e. 2.78% of a total number of 1793 caesarean sections performed in 2019. On the other hand, studies conducted in certain countries have found SSI rates after caesarean section of 9.1% in Nigeria [3], 10.9% in Tanzania [4], 12.6% in Nepal [5] and 24.2% in India [6]. Infectious complications were dominated by endometritis (68%), parietal suppuration (30%) and pelviperitonitis (2%). The 20-29 age group was the most represented at 66%. The mean age was 26.8 years, with extremes of 19 and 35 years. Patients with no schooling accounted for 72%. Camara A [7] and Traoré PB [8] reported 76% and 77% respectively of women with no schooling. Labour was the most common reason for admission with 46%. Our result is close to those of Berthe B [9] and Diallo FB [10] who reported 42% and 54% respectively. In our study, 40% of patients came on their own, 36% were referred and 24% were evacuated. Caesarean sections were performed urgently in 92% of cases. This rate is higher than that of Sacko I [11] who reported 78.33% of caesarean sections performed urgently. Emergencies are a factor in the occurrence of post-caesarean section infection. This can be explained by the fact that these caesarean sections are performed in extreme emergency conditions, where the rules of asepsis and antisepsis are not always respected. The most frequent indication for caesarean section was acute foetal distress (42%). We have noted that long labour was the most frequent infectious risk factor with 46%, Marzouki M. [14] and Saad B. [15] reported respectively 46% of premature rupture of membranes over 12 hours and 50% of long labour. The explanation that could be given here is that the longer the duration of labour, the longer the time it takes for the egg to open, and the more frequent the vaginal touches, the greater the risk of germs ascending from the vagina into the uterine cavity. We found that patients operated on for acute foetal distress had more endometritis and parietal suppuration (36%). We noted that the occurrence of post-caesarean section infections decreased when the surgeon was qualified, so there is a relative risk between the surgeon and post-caesarean section infectious complications. In our study, Escherichia coli, Staphylococcusaureus, Streptococcus agalactiae, Proteus mirabilis and Proteus vulgaris were the germs found. Diallo A Z. [16] and Sacko M. [17] reported Escherichia coli, Staphylococcus aureus, Enterococcus faecalis and Acinetobacter baumannii. Escherichia coli and Staphylococcus aureus are the germs most responsible for the occurrence of infectious complications at the surgical site.

CONCLUSION

Post-caesarean bacterial infections are common in our department. The main germs are Escherichia coli and Staphylococcus aureus. Better identification and prevention of the factors contributing to infection could significantly reduce these infections.

Conflict of interest: None

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