

Post-Caesarean Surgical Site Infections at the Reference Health Center of Commune V (Mali)

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Abstract

During this study period, we recorded 10187 deliveries, including 2763 caesarean sections. Surgical site infections were found in 102 caesarean sections, i.e. 3.69%. We found that age over 35 years, history of diabetes, asthma, sickle cell anemia, obesity (BMI > 30 kg/m²) and history of caesarean section were risk factors for the occurrence of an infection at the surgical site. The bacteriological profile was dominated by *Staphylococcus Aureus* (21%) followed by *Klebsiella Pneumoniae* (20%) and *Escherichia Coli* (16%). Superficial infection was the most common at 65%. Most of the germs were sensitive to imipenems; to the ertapenems; amikacin; gentamycin; colistin and ciprofloxacin. *Klebsiella* was the germ most resistant to common antibiotics.

Keywords: ISO, Caesarean section, Obstetrics, CSRef-Mali.

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INTRODUCTION

The caesarean section is an artificial delivery technique that allows the extraction of the fetus and its adnexa after the uterus has been surgically opened [1]. These indications are very broad and concern practically all obstetric pathologies [1]. Despite the safety of this operation thanks to advances in anesthesia, asepsis, antisepsis, resuscitation and antibiotic therapy, it is not trivial. Indeed, it can be punctuated by variable complications ranging from morbid complications to maternal death. These complications are multiple, namely: general complications; infectious complications and more specifically surgical site infections (SSIs). Infection is defined as the penetration into an organism of a foreign agent (bacteria, virus, fungus, parasite) capable of multiplying and inducing pathological lesions [2]. Postoperative infection remains a major public health problem due to its frequency, cost and severity.

Among healthcare-associated infections, surgical site infections (SSIs) are in third place (14.2%), in order of frequency, after urinary tract infections (30.3%) and pneumonia (14.7%) [3,4]. According to the WHO, the surgical site infection (SSI) rate varies from 0.5 to 15%, and has exceeded 25% in some developing countries [5]. Surgical site infections (SSIs) have a case fatality rate of 2.5 to 4% [6]. Even though the occurrence of surgical site infections depends on several factors, namely: patient-related factors, factors related to surgical procedures, and environmental and organizational factors [7]. These infections are in the majority of cases preventable. Post-operative infectious complications are a major problem in surgery. They are the leading cause of morbidity and mortality in surgery and increase the cost and length of hospital stay by a factor ranging from 1.5 to 2.5 depending on the type of intervention [8, 9]. They complicate 15.9% of interventions in African countries compared to 2% in developed countries. In the United States, the overall incidence of healthcare-

associated infections is 3-5% to 9.2% in intensive care units [10]. In France between 2012 and 2017, the share of healthcare-associated infections increased from 13.5 to 16% according to the French public health agency Santé Publique France [11]. This prevalence is estimated at (10.9%) in Senegal, (12%) in Côte d'Ivoire, (10%) in Benin [12]. In Mali, at the Gabriel Touré University Hospital, Thais AAA [13]; Traoré M [14] and Dembélé DD [15]. Had respectively recovered 12.3%; 4.7% and 32% ISO. However, it seemed useful to us to carry out this work to study the risk factors that influence the occurrence of surgical site infections in the gynecology-obstetrics department of the CS Ref CV in the district of Bamako.

Objectives

The aim was to assess the prevalence of surgical site infections; to determine the factors associated with surgical site infections in caesarean sections; Describe the bacteriological profile of surgical site infections.

MATERIALS AND METHODS

This was a cross-sectional, retrospective case-control study from January 1, 2022 to January 31, 2023, i.e. a period of 13 months in the Gynecology and Obstetrics Department of the Reference Health Center of the Commune V of the district of Bamako and at the BIOTECH biomedical analysis laboratory of the Bamako Medical Forum. The population to be studied is made up of all patients who gave birth in the department during the study period.

1 case for 2 controls. **Inclusion criteria: For Cases:** All patients who had been caesarean section with an infection of the surgical site and who had received a pus sample for cyto-bacteriological examination were considered as cases. **For Controls:** All patients who had been caesarean section and who had not developed an infection at the surgical site were considered as controls. **Inclusion criteria: For Cases:** Not included in the study: All patients admitted to the ward for surgical site infection whose caesarean section took place in another health facility. All patients who have been caesarean section and who have developed an infection other than that of the surgical site. **For Controls:** The following were not included in the study: Caesarean section patients who did not develop an operating site infection and who were not treated in the department. Other procedures other than caesarean section.

Matching Criteria: Were matched: Emergency caesarean sections and scheduled caesarean sections.

Sample size: We conducted a comprehensive sampling of all cases that met the inclusion criteria above; sample size was calculated using Schwartz's formula:

$$n = z^2 \cdot \frac{P \cdot Q}{i^2}$$

n: sample size.

p: the prevalence of cases of surgical site infection at the CS Ref of the CV of the district of Bamako was estimated at 5.25% according to the study by Ousseni OULALE IN 2019.

Q: 1-P

i: the absolute accuracy desired

Z: value dependent on the risk of error alpha (for alpha=0.05; Z=1.96)

q=1-P=1-0.0525 q=0.9475

$$n = (1.96)^2 \frac{(0.0525)(0.9475)}{(0.05)^2} = 76.43 \quad N=76$$

Data were collected from:

Survey sheets; Hospitalization records; Partograms; Reference/evacuation registers; Carnets de CPN; Operative report, Results of pus examinations carried out as follow-up: Study procedure: The identification of an SSI was sampled by swab for bacteriological examination with antibiogram at the private BIOTECH laboratory in commune V.

In the bacteriology laboratory, direct examination under the microscope is done after Gram staining before inoculating the pathological product on culture medium to isolate and identify the germ(s). The antibiogram is performed with antibiotic discs chosen according to the germ. The following materials were used to carry out this work: Sterile cotton-tipped swabs for pus sampling; Culture media to isolate germs; Reagents for identifying the various bacteria; Incubators at 37°C; Antibiotic discs to perform the antibiogram; An optical microscope for direct examinations; A source of flame.

Prevention of Complications:

All patients were previously put on antibiotics for infection prevention, in accordance with the policies standards and procedures (PNP) in force in Mali. Data processing and analysis: The processing of the collected data was carried out on the Office Word 2013 software. The data analysis was done on the SPSS software and the statistical test used was the odds ratio, the confidence interval and the P-value. The variables studied: Qualitative variables were, among others: Level of study, Occupation, Provenance, Reason for admission, History, ANC, Condition of the membranes, Type of anesthesia, Surgical site infection, Result of the sample. Quantitative variables: Age, Working time, Duration of the intervention. The practical conduct of the study: The collection was carried out with standardised survey sheets from the childbirth registers, partograph, dressing register, nurses, and medical records of the parturients. Ethical consideration and informed consent: during our study, informed consent was requested from all patients and their anonymity was respected.

RESULTS

Epidemiological aspects

Prevalence: During our 13-MONTH study (JANUARY 1, 2022 to JANUARY 31, 2023), we recorded 10187

deliveries including 2763 caesarean sections (27%). Surgical site infections were found in 102 cases of caesarean sections (3.69%). The age groups from 19 to 24 years and above 35 years were associated with a risk of having an SSI. All occupations were associated with a

risk of SSI occurrence. Illiterate, primary and higher levels of education were associated with a risk of having an SSI. Married and single marital status were associated with a risk of occurrence of the respective OR SSIs 2.021 95% CI [1.579-2.588] and 1.500 95% CI [0.613-3.670].

Table 1: Epidemiological aspects

Age	Surgical site infection		Total	GOLD	IC
	Case	Witnesses			
Less than 19 years of age	6 (5,88)	18 (8,82%)	24 (7,84%)	0,6458	[0,2482-1,6804]
19 years to 24 years	34 (33,33)	63 (30,88%)	97 (31,70%)	1,1190	[0,6736-1,8592]
25 to 34 years old	21 (20,59)	90 (44,12% °)	111 (36,27%)	0,3284	[0,1887-0,5714]
Older than 35 years	41 (40,20)	33 (16,17%)	74 (24,18%)	3,4829	[2,0222-5,9985]
Total	102	204	306		
Profession	Surgical site infection		Total	GOLD	IC
	Case	Witness			
Housewives	62 (60%)	125 (61,27%)	187 (61,11%)	2,016	[1,487-2,734]
Official	18 (17,64%)	25 (12,25%)	43 (14,05%)	1,389	[0,758-2,546]
Merchant	10 (9,80%)	19 (9,31%)	29 (9,48%)	1,900	[0,883-4,086]
Domestic help	2 (1,96%)	7 (3,43%)	9 (2,94%)	3,500	[0,727-16,848]
Student	10 (9,80%)	28 (13,73%)	38 (12,42)	2,800	[1,360-5,764]
Total	102	204	306		
Level of education	Surgical site infection		Total	GOLD	IC
	Case	Witness			
Illiterate	28 (27,45%)	50 (24,51%)	78 (25,49%)	1,786	[1,124-2,836]
Primary	13 (12,75%)	93 (45,59%)	106 (34,64%)	7,154	[4,004-12,781]
secondary	33 (32,35%)	32 (15,69%)	65 (21,24%)	0,970	[0,596-1,577]
Upper	28 (27,45%)	29 (14,22%)	57 (18,63%)	1,036	[0,616-1,741]
Total	102	204	306		
Marital status	Surgical site infection		Total	GOLD	IC
	Case	Witness			
Bride	94 (92,16%)	190 (93,14%)	284 (92,81%)	2,021	[1,579-2,588]
Bachelor	8 (7,84%)	12 (5,88%)	20 (6,54%)	1,500	[0,613-3,670]
Divorced	0	2 (0,98%)	2 (0,65%)		
Total	102	204	306		

Factors associated with surgical site infections

Coming on her own was associated with a risk of occurrence of OR SSIs: 1.243 95% CI [0.905-1.705]. Regardless of the mode of transport used, it was associated with a risk of ISO. Origins from communes V, IV and III were associated with a risk of occurrence of SSIs with ORs of 2.3686 95% CI [1.3868-4.0455]; 1.0966 95% CI [0.3651-3.0463] and 2.0099 95% CI [0.1244-32.4662]. Pregnancy was associated with a risk of SSIs. A body mass index greater than 30 is a pejorative risk for surgical site infection and this risk is

proportional to the increase in BMI. Class 1 was associated with a risk of ISO OR 2.141 95% CI [1.673-2.737]. Being in labour was associated with a risk of SSI, OR = 1.238 95% CI [0.880-1.741]. Rupture of the water was associated with a risk of ISO OR=1.409 95% CI [0.414-0.764]. Of the indications for caesarean sections, the history of repetitive caesarean section was the most numerous. Caesarean sections that lasted more than one hour were associated with a risk of SSI OR=1.830 95% CI [1.491-2.245]. These associated factors are presented in Tables 2, 3 and 4.

Table 2: Factors associated with surgical site infections

Coming of her own accord	Surgical site infection		Total	GOLD	IC
	Case	Witnesses			
Yes	44 (43,14%)	72 (35,29%)	116 (37,91%)	1,243	[0,905-1,705]
No	58 (56,86%)	132 (64,71%)	190 (62,09%)	0,893	[0,753-1,060]
Total	102	204	306		
Means of transport	Surgical site infection		Total	GOLD	IC
	Case	Witness			
Personal vehicle	27 (26,47%)	93 (45,59%)	120 (39,22%)	3,444	[2,244-5,287]
Public transport	56 (54,90%)	77 (37,74%)	133 (43,46%)	1,375	[0,975-1,940]

	ambulance	19 (18,63%)	34 (16,67%)	53 (17,32%)	1,789	[1,021-3,137]
Total		102	204	306		
Gesturity		Surgical site infection		Total	GOLD	IC
		Case	Witness			
	Primitest	29 (28,43%)	49 (24,02%)	78 (25,49%)	1,690	[1,068-2,674]
	Paucigeste	35 (34,31%)	39 (19,12%)	74 (24,18%)	1,114	[0,706-1,759]
	Multi-gesture	27 (26,47%)	81 (39,71%)	108 (35,29%)	3,000	[1,941-4,637]
	Great-multi gesture	11 (10,78%)	35 (17,16%)	46 (15,03%)	3,182	[1,616-6,265]
Total		102	204	306		

Table 3: Factors associated with surgical site infections

Type	Surgical site infection						
		Case	Witnesses	GOLD	IC		
Anaemia	Yes	3	10	0,683	[0,250-1,866]		
	No	99	194	1,162	[0,853-1,582]		
Sickle-cell anemia	Yes	2	3	1,204	[0,407-3,565]		
	No	100	201	0,899	[0,437-1,846]		
HIV	Yes	0	8	-	-		
	No	102	296	1,520	[1,401-1,650]		
Malnutrition	Yes	0	4	-	-		
	No	102	200	1,510	[1,393-1,637]		
Diabetes	Yes	7	5	1,805	[1,088-2,994]		
	No	95	199	0,616	[0,314-1,208]		
Asthma	Yes	6	6	1,531	[0,850-2,760]		
	No	96	198	0,419	[0,419-1,315]		
BMI		Surgical site infection		Total	GOLD	IC	
		Case	Witnesses				
		18.5 to 24.9	19 (18,63%)	109 (53,43%)	128 (41,83%)	0,1995	[0,1129-0,3526]
		25 to 29.9	38 (37,25%)	83 (40,69%)	121 (39,54%)	0,8656	[0,5308-1,4115]
		30 to 34.9	25 (24,51%)	9 (4,41%)	34 (11,11%)	7,0346	[3,1411-15,7546]
		35 to 40	20 (19,61%)	3 (1,47%)	12 (3,92%)	16,3415	[4,7271-56,4920]
Total		102	204	306			
Score ASA		Surgical site infection		Total	GOLD	IC	
		Case	Witness				
		ASA 1	93 (91,18%)	199 (97,55%)	292 (95,42%)	2,141	[1,673-2,737]
		ASA 2	8 (7,84%)	4 (1,96%)	12 (3,92%)	0,500	[0,151-1,660]
		ASA 3	1 (0,98%)	1 (0,49%)	2 (0,65%)	1,000	[0,063-15,988]
Total		102	204	306			
Work		Surgical site infection		Total	GOLD	IC	
		Case	Witness				
		Yes	68 (66,67%)	121 (59,31%)	189 (61,76%)	1,238	[0,880-1,741]
		No	34 (33,33%)	83 (40,69%)	117 (38,24%)	0,902	[0,771-1,057]
Total		102	204	306			
Water Bag		Surgical site infection		Total	GOLD	IC	
		Case	Witness				
Intact		59 (57,84%)	158 (77,45%)	217 (70,92%)	0,563	[0,414-0,764]	
Broken		43 (42,16%)	46 (22,55%)	89 (29,08)	1,409	[1,134-1,750]	
Total		102	204	306			

Table 4: Factors associated with surgical site infections

Indication for caesarean section	Surgical site infection		Total	GOLD	IC
	Case	Witnesses			
Pre-uterine rupture	6	2	8	0,333	[0,067-1,652]
Cross-functional presentation	3	33	36	11,000	[3,374-35,866]
Presentation of the front	1	12	13	12,000	[1,560-92,287]
Face presentation	0	5	5	-	-
Presentation of the seat	5	12	17	2,400	[0,846-6,812]

Fetal macrosomia	5	6	11	1,200	[0,366-3,932]
Dynamic dystocia	0	2	2	-	-
Placenta previa	3	2	5	0,667	[0,111-3,990]
Retroplacental hematoma	2	5	7	2,500	[0,485-12,886]
Pre-eclampsia/hypertension	6	7	13	1,167	[0,392-3,471]
Cord prolapse clapper or procubitus of the cord	1	0	1	-	-
Fetal Suffering Acute / Chronic	36	30	66	0,833	[0,513-1,353]
Cord Circular by funicular pathology	2	0	2	-	-
Oligoamnios	5	0	5	-	-
History of caesarean section Iterative	22	78	100	3,545	[2,209-5,691]
Medical pathology of the mother	5	1	6	0,200	[0,023-1,712]
Other	0	9	9	-	-
Total	102	204	306		

Duration of the caesarean section	Surgical site infection		Total	GOLD	IC
	Case	Witnesses			
< 1 hour	32 (32,37%)	147 (72,06%)	179 (58,50%)	0,324	0,228-0,461
>= 1 hour	70 (68,63%)	57 (27,94%)	127 (41,50%)	1,830	1,491-2,245
Total	102	198	306		

Operator	Surgical site infection		Total	GOLD	IC
	Case	Witness			
General practitioner	22 (21,57%)	7 (3,43%)	29 (9,48%)	0,318	0,136-0,745
DES/EFFI	65 (63,73%)	147 (72,06%)	212 (69,28%)	2,262	1,689-3,028
Obstetrician-gynaecologist	15 (14,71%)	50 (24,51%)	65 (21,24%)	3,333	1,872-5,936
Total	102	204	306		

The Bacteriological Profile

Types of infections, main germs identified and therapeutic aspects. Of the surgical site infections, 64.7% were superficial infections. Antibiotic prophylaxis based on Amoxicillin + clavulanic acid and Metronidazole was associated with a risk of surgical site infection OR=2.658

95% CI [2.042-3.460]. Among the cases of surgical site infections, Staphylococcus Aureus was the most common germ (21%), followed by Klebsiella Pneumoniae (20%) and Escherichia Coli (16%). The most common germs were sensitive to quinolones and aminoglycosides, less sensitive to amino-penicillins.

Table 5: Distribution by postoperative antibiotic prophylaxis

Postoperative antibiotic prophylaxis	Surgical site infection		Total	GOLD	IC	
	Case	Witnesses				
Amoxicillin + Metronidazole	14 (13,73%)	2 (0,98%)	16 (5,23%)	0,143	0,032	0,629
Amoxicillin + Clavulanic Acid + Metronidazole	76 (70,51%)	202 (99,02%)	278 (90,85%)	2,658	2,042	3,460
Ceftriazone + Gentamicin	6 (5,88%)	0	6 (1,96%)	-	-	-
Ciprofloxacin + Metronidazole	5 (4,90%)	0	5 (1,63%)	-	-	-
Total	102	204	306			
Type of surgical site infection	Actual			Percentage %		
Superficial	66			64,7		
Deep	22			21,6		
Organ/space	14			13,7		
Total	102			100,0		

Table 6: The main germs isolated

Isolated germs	Staff	Percentage %
Staphylococcus aureus	22	21
Klebsiella Pneumoniae	20	20
Escherichia coli	16	16
Escherichia Coli + Staphylococcus Aureus	11	11

Klebsiella Pneumiae + Staphylococcus Aureus	8	8
Klebsiella Pneumoniae + Escherichia Coli	2	2
Staphylococcus Aureus + Actinobacter Baumannii	2	2
Klebsiella + Spp pneumonia + Proteus mirabilis	1	1
Enterobacter Focalis + Candida Albicans	1	1
Enterobacter Focalis	1	1
TOTAL	84	83
Sterile cultures	18	17
Total	102	100

Table 7: Distribution by susceptibility of germs to antibiotics

Germ/ATB	Ciprofloxacin	Ofloxacin	Cefalotine	Ceftriaxone	Amoxicillin	Amoxicillin + Clavulanic Acid	Ertapenem	Imipenem	Gentamycin	Tobramycin	Amikacin	Erythromycin
Staphylococcus aureus	100%	90%	80%	100%	0	45%	100%	100%	90%	70%	80%	90%
Escherichia coli	90%	70%	49%	100%	0	67%	100%	100%	80%	60%	78%	0
Klebsiella Pneumoniae	20%	10%	40%	0	0	10%	98%	98%	30%	0	90%	0
Actinobacter Baumannii	100%	0	0	100%	0	100%	100%	100%	100%	0	100%	0
SPP Pneumonia	0	0	0	100%	0	100%	100%	100%	100%	100%	100%	100%
Proteus Mirabilis	0	0	0	0	0	100%	100%	100%	100%	0	100%	100%
Enterobacter Focalis	0	0	100%	100%	0	0	100%	100%	100%	100%	100%	100%

DISCUSSION

Epidemiological aspects and factors associated with infections

We recorded 10187 deliveries, including 2763 caesarean sections (27.12%). Surgical site infections were found in 102 caesarean sections, i.e. a prevalence of around 3.69%. Diallo AZ [16] Oulalé O. [17] recovered 4.2% and 5.25% respectively. In our study, the age groups [19 years to 24 years] and [greater than 35 years] were associated with the occurrence of surgical site infection, with respective odds ratios of 1.1190 for a 95% CI [0.6736-1.8592] and 3.4829 for a 95% CI [2.0222-5.9985]. In our study, regardless of the profession, the risk of association of surgical site infections was high. This risk was higher among domestic helpers with OR=3.500 95% CI [0.727-16.848]. This high risk could be explained by the vulnerability of this layer, which is often short of financial resources and assistance. Patients with a secondary level of education had no risk of surgical site infection OR=0.970 and the other categories (illiterate, primary, and higher) were associated with a risk of surgical site infection occurring with the respective ORs 1.786, 95% CI [1.124-2.836]; 7.154, 95% CI [4.004-12.781] and 1.036, 95% CI [0.616-1.741]. Oulalé [17] reported: 57.17% of patients not instructed with Chi:231.43 and P-value < 0.001. During our study, 116 patients came on their own, and had a high risk of having

a surgical site infection OR=1,243. This could be explained by the fact that the patients who came on their own were those who did not have a reference document and often had stayed in other health facilities. Patients admitted in a personal vehicle had a high risk of developing a surgical site infection. Oulalé [17] reported that 31.67% of patients were evacuated and Diallo AZ [16] 78.1%.

We established an association relationship between the occurrence of surgical site infections and the origins of commune V, commune IV, and commune III with respective ORs of 2.3686 95% CI [1.3868-4.0455]; 1.0966 95% CI [0.3651-3.0463] and 2.0099 95% CI [0.1244-32.4662]. During our study, maternal pathologies (diabetes, asthma and sickle cell anemia) were more associated with the occurrence of surgical site infection with respective ORs 1.805, 95% CI [1.088-2.994]; 1.531 95% CI [0.850-2.760] and 1.204 95% CI [0.407-3.565]. In our study, being pregnant was a risk factor for surgical site infection. Oulalé [17] reported in 2019 that 45% of these patients were pauciparous. During the study, obesity was a factor associated with the occurrence of surgical site infection. The risk of occurrence was proportional to the body mass index from 30Kg/m² with OR=7.0346 95% CI [3.1411-15.7546] for BMI between 30 and 34.9 Kg/m² and 16.3415 95% CI [4.7271-56.4920] for BMI between 35

and 40 Kg/m². During our study, we established that labour was associated with a risk of occurrence of OR site infection=1.238, 95% CI [0.880-1.741]. This could be explained by the multiple vaginal touches during examinations in the delivery room. At admission, 89 (29.08%) patients had ruptured membranes and this was a factor associated with the occurrence of surgical site infection, OR=1.409, 95% CI [1.134-1.750]. This could be explained by the ascent of vaginal germs into the uterine cavity, multiple vaginal touches and often by examinations with non-sterile gloves. Regarding indications, we found that indications for dystocic presentation (transverse presentation, forehead presentation, and breech) were associated with a risk of surgical site infection with ORs respectively 11,000 95% CI [3.374-35.866]; 12,000 95% CI [1.560-92.287]; 2.400 95% CI [0.846-6.812]. Other indications such as fetal macrosomia, hypertension and its complications (HRP and pre-eclampsia) and history of repetitive caesarean section were also associated with a risk of surgical site infection OR 1.200 95% CI [0.366-3.932]; 2.500 95% CI [0.485-12.886]; 1.167 95% CI [0.392-3.471]; 3.545 95% CI [2.209-5.691]. Caesarean sections lasting more than one hour were associated with a risk of surgical site infection OR= 1.830 95% CI [1.491-2.245]. Being operated on by a DES/EFFI or by a gynaecologist was associated with a risk of surgical site infection OR: 2.262 95% CI [1.689-3.028] and OR: 3.333 95% CI [1.872-5.936]. This risk is independent of the operator because these caesarean sections were iterative caesarean sections or for maternal comorbidities (hypertension, HRP, diabetes, sickle cell anemia).

Bacteriological profile

In our study, superficial surgical site infections were the most numerous at 64.7% and the most common germs found were Staphylococcus Aureus, Klebsiella Pneumoniae and Escherichia Coli with 21%, 20% and 16% respectively. Oulalé [17] reported 56.85% of superficial surgical site infections and Staphylococcus Aureus was found in 14.25%.

The difficulties of the study: Like any study, despite the good progress we encountered some difficulties, namely: The time frame for the rupture of the membranes is not specified; The non-hospital care of certain patients who are therefore not declared.

CONCLUSION

During our study, surgical site infections were common. We found that age over 35 years, history of diabetes, asthma, sickle cell anemia, obesity (BMI > 30 kg/m²) and history of caesarean section were risk factors for the occurrence of an infection at the surgical site. The bacteriological profile was dominated by Staphylococcus Aureus followed by Klebsiella pneumoniae and Escherichia coli.

Conflict of Interest: None

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