

Study on Post Caesarean Section Wound Infection at Misurata Central Hospital and Al-Khoms Teaching Hospital, Libya.

Mahmoud M. Osela

Head, Dept. Of Obstetrics And Gynaecology, Faculty Of Medicine, Al-Margeb University, Al-Khoms, Libya

Abstract: Now-a-days, caesarean section is a most common practice in Obstetric practices. Post Caesarean wound infection is a widespread aversion to caesarean delivery in developing countries. In order to control and prevent the post C/S wound infection in our places, there is a need to assess the relative contribution of each etiological factor. The aims this study to determine the incidence of post caesarean section wound infections among the patients at Misurata Central Hospital and Al-khoms teaching hospital in Libya and to identify risk factors and common bacterial pathogens in the same places.

A prospective study was conducted in the Obstetrics and Gynaecology Department with the admitted total of 1035 C/S cases (710 from Misurata central hospital and 325 from Al-khoms Teaching hospital) for one year during 2014. Of these total cases, 28 cases from Misurata central hospital, Libya and 10 cases from Al-khoms teaching hospital, Libya were observed Post operative wound infections and complications cases. Various data and samples collected and bacterial samples (Collected) were inoculated in different media (Oxoid, UK) and identified at the central laboratory, Misurata central hospital, Libya.

In most parameters, Al-khoms city has more cases of post C/S wound infection than Misurata. Age, parity, gestational age, days of hospitalisation, Emergency cases, Diabetes Mellitus, Anaemia, UTI, Treatment type and SROM are the risk factors in this study. *Staphylococcus sp.* is more predominant in both wound swab and urine culture. Strict labour management policies, administration of antibiotic prophylaxis with rigorous surgical techniques reduces the post C/S wound infections.

Keywords: Post caesarean section wound infection, Al-khoms and Misurata Hospital.

I. Introduction

A post caesarean section wound infection (PCSWI) is an infection that occurs after a C-section, which is also referred to as an abdominal or caesarean delivery. It is usually due to a bacterial infection in the surgical incision site. It represents a substantial burden to the health system and the prevention of such infections should be a healthcare priority in developing countries (Nwankwo et al., 2012). The global estimates of surgical site infections (SSI) are from 0.5–15% (Arabashahi and Koochpayezade, 2006). Wound infections can be attributed to a preoperative bacterial load in the tissue at the site of surgery and the diminished integrity of the host's defences (Yohannes et al., 2009). Some of the risk factors observed for C/S wound infections are obesity, diabetes, poor prenatal care, immunosuppressive disorders, chorioamnionitis, a previous Caesarean delivery, certain medications like steroids and the lack of pre-incision antimicrobial care, excessive blood loss during labor, delivery, or surgery and lengthy labour and surgery (Gong et al., 2012). Any infection of the abdominal wound complicating C/S should be minimised through strict preventative measures, such as antisepsis, preoperative preparation, a reduction in the duration of surgery, a reduction in blood loss, the use of absorbable sutures and avoiding cross-infection. Many studies have proved that antimicrobial prophylaxis is effective in reducing the incidence of postoperative wound infections as it reduces the risk of resident bacteria overcoming the immune system in the immediate postoperative period (Young et al., 2012).

A C-section wound infection is categorized as either wound cellulitis or a wound (abdominal) abscess. C-section wound infections may also spread and cause problems with organs, the skin, the blood, and local tissue. Wound infections significantly affect the patient's quality of life by increasing morbidity and extending hospital stays. The delivery of high-quality services with early interventions to reduce wound infections is an important aspect of patient safety measures. Therefore, the author aims this study to determine the incidence of post caesarean section wound infections among the patients at Misurata Central Hospital and Al-khoms teaching hospital in Libya and to identify risk factors and common bacterial pathogens in the same places.

II. Materials And Methods

A prospective study was conducted in the Obstetrics and Gynecology Department with the admitted total of 1035 C/S cases (710 from Misurata central hospital and 325 from Al-khoms Teaching hospital) for one year during 2014. Of these total cases, 28 cases from Misurata central hospital, Libya and 10 cases from Al-khoms teaching hospital, Libya were observed Post operative wound infections and complications cases.

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Patient's history, Age, Parity, gestational age, days of bed occupancy, indications of C/S, types of C/S undergone, type of infections, skin lesions and treatment, Baby weight and anaemia of mother, Blood group of mother, SROM and different culture types of data were collected during post operation C/S and compared with the healing time and life style improvement. Data and samples were collected by trained technician and Gynaecologist.

Post C/S wound identified as follow:

Wound infections are defined as inflammation or sepsis with or without positive bacterial cultures. Common signs include fever (100.5°F to 103°F), wound sensitivity, and lower abdominal pain.

Wound infections were diagnosed by the:

- wound appearance
- healing progress
- the presence of common infection symptoms
- the presence of certain bacteria

Bacterial samples (Collected) were inoculated in different media (Oxoid, UK) and identified at the central laboratory, Misurata central hospital, Libya.

III. Results And Discussions

Misurata and Al-khoms are two cities in the north-western part of Libya. Percentages (Table 1) of wound cases are more in Al-khoms (3.07%) than Misurata (2.53%). At the same time, % of C/S cases is more (10.78%) in Misurata. Surgical wound infections occur in approximately 3% of patients having major laparotomy incisions for procedures such as cesarean delivery or abdominal hysterectomy (Jamie and Duff, 2003). But in Kenya, the caesarean delivery rate was 7.8%. The overall post-caesarean wound infection rate was 19% (Koigi et al., 2005).

Table1: % of C/s cases in Misurata central hospital and Al-khoms teaching hospital, Libya.

S. No.	Types	Misurata	Al-khoms
1	Normal Delivery	6600	3397
2	C/S cases	710	325
3	Post C/S wound cases	18	10
4	% of Wound cases	2.53%	3.07%
5	% of C/S cases	10.78%	9.57%

N.B. In all tables, % is calculated from the total number of C/S cases in the respective city.

Table2: Age-wise (Maternal) c/s cases and post c/s wound infection cases:

S. No.	Age (Years)	Misurata			Al-khoms			
		Normal cases (Nos.)	c/s	Post infection (Nos.)	%	Normal c/s cases (Nos.)	Post infection (Nos.)	%
1	15-20	70		00	00	15	00	00
2	21-25	101		04	0.56	62	02	0.62
3	26-30	350		05	0.70	161	05	1.54
4	31-35	101		04	0.56	62	02	0.62
5	36-40	70		05	0.70	15	01	0.30
6	Total	692		18	02.52	315	10	03.08

Table3: Parity and post c/s wound infection cases:

S. No.	Parity	Misurata		Al-khoms	
		Post c/s infection (Nos.)	%	Post c/s infection (Nos.)	%
1	Po	05	0.70	04	1.23
2	P1-5	10	1.40	05	1.54
3	P ≥ 6	03	0.42	01	0.30
4	Total	18	2.52	10	3.07

Table4: Gestational Age and Post c/s wound infection cases:

S. No.	Gestational age	Misurata		Al-khoms	
		Post c/s infection (Nos.)	%	Post c/s infection (Nos.)	%
1	28-37	03	0.42	02	0.62
2	38-40	14	1.97	08	2.46

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3	41-42	1	0.14	00	00
4	Total	18	2.53	10	3.08

Table5: Days of Bed occupancy and Post c/s wound infection cases:

S. No.	Days	Misurata		Al-khoms	
		Post c/s infection (Nos.)	%	Post c/s infection (Nos.)	%
1	1-5	00	00	00	00
2	6-10	07	0.99	06	1.84
3	11-15	09	1.27	04	1.23
4	16-20	02	0.28	00	00
5	21-25	00	00	00	00
6	Total	18	2.54	10	3.07

Table6: Indications of c/s and wound infection cases:

S. No.	Indications	Misurata		Al-khoms	
		Post c/s infection (Nos.)	%	Post c/s infection (Nos.)	%
1	FD	5	0.71	2	0.62
2	Big Baby	3	0.42	1	0.30
3	Previous 2 c/s	3	0.42	2	0.62
4	Multipara+BTL	1	0.14	1	0.31
5	Intrapartum Hemorrhage (APH)	2	0.28	1	0.30
6	CPD	2	0.28	1	0.31
7	Cord Prolapse	1	0.14	1	0.30
8	Transversus Lie	1	0.14	1	0.31
9	Total	18	2.53	10	3.07

(FD- Foetal Distress; BTL- Bilateral tubal ligation; CPD- Cephalopelvic Disproportion)

Table7: Types of c/s and DM and Post infection cases:

S. No.	Types of c/s	Misurata		Al-khoms	
		Post c/s infection (Nos.)	%	Post c/s infection (Nos.)	%
1	Emergency	16	2.25	07	2.15
2	Elective	02	0.28	03	0.92
3	Total	18	2.53	10	3.07
	DM				
1	Present	06	0.85	02	0.62
2	Absent	12	1.69	08	2.46
3	Total	18	2.54	10	3.08

Table8: UTI and Vaginosis and post c/s wound infection cases:

S. No.	UTI	Misurata		Al-khoms	
		Post c/s infection (Nos.)	%	Post c/s infection (Nos.)	%
1	Present	09	1.27	06	1.84
2	Absent	09	1.27	04	1.23
3	Total	18	2.54	10	3.07
	Vaginosis				
1	Present	15	2.11	08	2.46
2	Absent	03	0.42	02	0.61
3	Total	18	2.53	10	3.07

Table9: Skin lesion and Treatment types and Post c/s wound infection cases:

S. No.	Skin Lesion	Misurata		Al-khoms	
		Post c/s infection (Nos.)	%	Post c/s infection (Nos.)	%
1	Present	13	1.83	05	1.54
2	Absent	05	0.70	05	1.54
3	Total	18	2.53	10	3.08
	Treatments				
1	Dressings only	12	1.69	06	1.84
2	Dressing + resuture	06	0.85	04	1.23
3	Total	18	2.54	10	3.07

Table10: Baby weight and Anemia and Post c/s wound infection cases:

S. No.	Baby weight (gm)	Misurata		Al-khoms	
		Post c/s infection (Nos.)	%	Post c/s infection (Nos.)	%
1	2000-3000	02	0.28	03	0.92
2	3001-4000	12	1.69	05	1.54
3	4001-5000	04	0.56	02	0.61
	Total	18	2.53	10	3.07
	Anaemia Hb \leq 10%				
1	Present	13	1.83	08	2.46
2	Absent	05	0.70	02	0.61
3	Total	18	2.53	10	3.07

Table11: Blood Group and Post c/s wound infection cases:

S. No.	Blood Group	Misurata			Al-khoms		
		Normal cases (Nos.)	c/s Post infection (Nos.)	%	Normal cases (Nos.)	c/s Post infection (Nos.)	%
1	A	312	08	1.13	142	05	1.54
2	B	192	05	0.70	31	01	0.30
3	AB	58	01	0.14	30	00	0.00
4	O	130	04	0.56	112	04	1.23
5	Total	692	18	2.53	315	10	3.07

Table12: SROM \leq 24hrs and Post c/s wound infection cases:

S. No.	SROM \leq 24hrs	Misurata			Al-khoms		
		Normal cases (Nos.)	c/s Post infection (Nos.)	%	Normal cases (Nos.)	c/s Post infection (Nos.)	%
1	Present	474	11	1.55	209	08	2.46
2	Absent	218	07	0.99	106	02	0.61
3	Total	692	18	2.51	315	10	3.07

(SROM - Spontaneous rupture of membranes)

Table13: Wound Swab culture and Post c/s wound infection cases:

S. No.	Wound Swab Culture	Misurata			Al-khoms		
		Normal cases (Nos.)	c/s Post infection (Nos.)	%	Normal cases (Nos.)	c/s Post infection (Nos.)	%
1	Staphylococcus sp.	210	04	0.56	93	04	1.23
2	Pseudomonas sp.	104	03	0.42	15	01	0.30
3	Streptococcus sp.	119	02	0.28	15	01	0.30
4	E. coli	68	01	0.14	32	00	0.00
5	Mixed growth	68	02	0.28	64	00	0.00
6	Contaminated	33	01	0.14	15	01	0.30
7	No growth	70	05	0.70	81	03	0.92
8	Total	692	18	2.54	315	10	3.05

Table14: Urine culture and Post c/s wound infection cases:

S. No.	Wound Swab Culture	Misurata			Al-khoms		
		Normal cases (Nos.)	c/s Post infection (Nos.)	%	Normal cases (Nos.)	c/s Post infection (Nos.)	%
1	Staphylococcus sp.	90	03	0.42	48	01	0.30
2	Pseudomonas sp.	90	00	0.00	48	01	0.30
3	Streptococcus sp.	42	02	0.28	15	00	0.00
4	E. coli	48	02	0.28	32	03	0.92
5	Proteus sp.	35	01	0.14	15	01	0.30
6	Klebsiella sp.	26	02	0.28	15	00	0.00
7	Contaminated	152	01	0.14	64	02	0.62
8	No growth	209	07	0.99	78	02	0.62
9	Total	692	18	2.53	315	10	3.06

Age-wise distribution post C/s wound cases (Table 2) are observed more (1.54%) in Al-khoms at the age group of 26-30 years old. Mixed results are observed in Misurata hospital. The number of delivery (Parity)

has direct effect on the post C/S wound infection. In this study, more wound infection cases are noted in the mother with 2 – 5 deliveries (Table 3) in both the cities. Wound infection cases correlated with the gestational ages of mother (Table 4) and find out that age group between 30 and 40 years with highest record in Al-khoms (2.46%). The same age group with more cases (1.97%) also have resulted in Misurata.

During comparing the post C/S wound infection cases with number of days presented in the bed (Table 5), the wound infected cases increases with an increase of days up to 15 days. The result reveals that it requires minimum 6 – 10 days for incubation periods. Cases with FD (Table 6) indicate have more (5 numbers) in Misurata and 2 numbers in Al-khoms. Table 7 gives that the wound infection is higher in an emergency cases than an elective cases and the value more or less equivalent in both the cities. Satyanarayan et al., (2011) reported rates of wound infections as high as 25.2% in emergency CS compared to 7.6% in elective cases. More cases of Diabetic mellitus with greater risk of infection is observed in Misurata than Al-khoms (Table 7). The factors increase the probability of postoperative wound infection are obesity, diabetes, immunodeficiency disorder, use of systemic corticosteroids, smoking, wound hematoma, and pre-existing infection such as chorioamnionitis and pelvic inflammatory disease.

UTI cases with post C/S wound infection are more (1.84%) in Al-khoms (Table 8) and Vaginosis also give its role in an increase of post C/S wound infection (Table 8) and observed more in Al-khoms city. The higher infection rate thinks the researcher to study the hygienic/health condition of Al-khoms people. Table 9 reveals that the Misuratan cases has more post C/S wound infection rate with skin lesions (1.83%) and Al-khoms (1.84%) during treat the patient with dressings only (without any resutures). So proper treatment is required for fast recovery without any complication.

Weight of the baby during born is not related to wound infection (Table 10) in this study. Anyhow, higher infection value is observed in both cities in babies with 3-4 kgs during birth. 2.46% of infection cases in Al-khoms is noted with cases have anaemic and 1.86% in Misurata. Anaemic level favours the infection of microbes during C/S. Mixed results of infection are noted during study with different blood types (Table 11) and have no correlations.

Table 12 indicates that the SROM case percentage is more in Al-Khoms (2.46%) than Misurata (1.55%). Wound swab culture (Table 13) shows that the *Staphylococcus sp.* are more in both the cities followed by *Pseudomonas sp.* Urine culture have more Staphylococcus sp. in both cities and more E.coli in Al-khoms which increases the post C/S wound infection. This result is similar to Dhar et al., (2014). The principal microorganisms that cause wound infections after obstetric or gynaecologic surgery are aerobic staphylococci and streptococci; aerobic Gram-negative bacilli, such as *E. coli*, *K. pneumoniae*, and *Proteus* species; and anaerobes. Staphylococci and streptococci are inoculated into the wound from the skin, and the latter organisms are transferred from the pelvic cavity as the surgeon closes the abdominal wound (Gibbs et al., 1983).

IV. Conclusion And Recommendations

The overall post-caesarean wound infection rate is quite high. In most parameters, Al-khoms city has more cases of post C/S wound infection than Misurata. Age, parity, gestational age, days of hospitalisation, Emergency cases, Diabetes Mellitus, Anaemia, UTI, Treatment type and SROM are the risk factors in this study. Staphylococcus sp. is more predominant in both wound swab and urine culture. It's important to get treated promptly to prevent complications from the infection. This may reduce the cost of treatment and duration of the stay in the hospital. Al-khoms has more cases when compared to the Misurata hospital cases. This is to be ascertaining by another study on the cleanliness or hygiene of both hospitals. Strict labour management policies need to be inculcated in labour wards in all Hospitals in order to ensure timely caesarean delivery interventions, and hence, reduce post-caesarean wound infection rates. The administration of antibiotic prophylaxis with rigorous surgical techniques also reduces the post C/S wound infections.

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