

Impact of Co-existent Infections on Surgical Site in Cesarean Deliveries

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Abstract

Background: Cesarean section is the commonest surgery in Obstetrics. Pregnancy is a physiologically immunocompromised state. Hence, it predisposes to many infections prior to, during and after surgery. The aim of this study to determine if any of these coexistent infections have an influence on surgical site healing.

Methods: This is a prospective study over 16 month's period from August 2013- December 2014. We enrolled patients who underwent cesarean deliveries at our institute and suffered from unrelated coexisting infections simultaneously. We observed how the surgical site healed in all these cases.

Results: Of the 79 cases with co-existent infections 15 had wound infections. Of these, 10 cases (71.43%) of LRTI ended up in wound infection and 8 (80%) of them required resuturing. 1 case with LRTI had wound dehiscence with subsequent utero cutaneous fistula. 2(16.67%) cases of UTI and (13.22%) URTI and 1 case of dengue fever also had poor wound healing.

Conclusion: Surgical Sites of patients with Lower Respiratory Tract Infections had the worst prognosis among all co-existent infections. They suffered the poorest wound healing and the highest rate of wound infections. These surgical sites also mostly required resuturing.

Keywords: Coexistent infections; Surgical site infection; Lower respiratory tract infection; Utero cutaneous fistula

Introduction

A large number of patients undergo cesarean deliveries everyday worldwide and most heal well and return home. Cesarean section is the commonest surgery performed in Obstetrics. Also, a well-known fact is that pregnancy is a physiologically immunocompromised state and hence many have other coexisting infections either prior to, during or after surgery. Whether these other infections in any way influence the prognosis of surgical site healing is not yet clearly known. To find out if this, the present study was planned. We have observed those cesarean delivery patients who had other co-existent infections and correlated them with the outcome of their surgical wounds.

Methods

This is a prospective study which was conducted over a period of 16 months between August 2013-December 2014 at Malla Reddy Hospital in Southern India. We identified, treated and followed up cases over the entire study period. The study was started after obtaining the approval from Hospital Ethics Research Committee. A written informed consent in local understandable language was taken in all patients included in the present study.

Inclusion criteria

All patients delivered by either elective or emergency cesarean section at our institute from August 2013- December 2014 i.e. over a span of 16 months were considered in the present study of whom those who had other coexistent infections either prior to, during or after the surgery were short listed. To minimize the subjective variations, all cesarean sections were lower segment cesarean sections; all were performed by Misgav Ladach technique [1]. All patients received Injectable Cefotaxime and Metrogyl for 48 hrs post-operatively. These patients were treated for their co-existent infections and were administered post-operative antibiotics simultaneously. All patients had antiseptic wound dressings with wound inspection done on their third post-operative day and suture removal on seventh post-operative day. All the Cesarean deliveries were done by Misgav Ladach technique

and all wounds were closed with non-absorbable nylon mattress sutures. Those patients who had wound discharges, dehiscence or infection had wound swabs taken and sent for pus culture and sensitivity immediately after suture removal on the 7th post-operative day to identify the infective organism.

Exclusion criteria

1. All patients who had co-morbid conditions like anemia, diabetes mellitus, gestational diabetes mellitus, pre-eclampsia, HELLP syndrome which are known to predispose to wound infections [2] were excluded from the study.
2. All patients who had co-existent wound infections which hamper the immune system and predispose to surgical site infections like HIV were also excluded from the present study.
3. All patients with BMI > 30 were excluded because it is a well-known fact that obesity predisposes to wound infection [3].
4. All patients with dermatological infections at the site of incision like furuncles, carbuncles were excluded.
5. All patients with genital tract infections like vaginitis, cervicitis and endometritis were also excluded considering the fact that these infections could directly influence a cesarean surgical site.
6. Patients who were administered antibiotics other than those in inclusion criteria were deleted from the study. Although, sexually transmitted infections affecting the external genitalia were included in the present study.

Statistical Analysis of the data obtained was analyzed with SPSS software using Chi square and t-tests. P value < 0.05 or suffered from infections or conditions that hampered the immune system.

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Results

We enrolled 83 patients in our study. Of these, 3 patients with lower respiratory tract infection deteriorated grossly during their post-operative period with a severe drop in oxygen saturation. They were ventilated and eventually referred to higher centres for further management. Also, an unbooked patient was operated as emergency LSCS for foetal distress developed post-operative convulsions was eventually diagnosed of tubercular meningitis on the 5th day after surgery. She was referred on the fifth day after surgery to a higher centre for further management. Due to this, there was loss of follow up of these patients and they were excluded from the study. Finally, we analysed the data obtained from 79 patients totally. All the demographic factors of these patients like age, socio economic status, BMI, gestational age at cesarean section, showed a statistically insignificant difference between those with and without wound infections indicating that no bias took place in selection of the study population (Table 1). Of all the cases, Upper respiratory tract infections were the commonest (Table 2). Of the 15 URTI cases, 13 patients healed well and 2 cases had wound gapes which was statistically insignificant. We encountered 14 cases of LRTI of which only 4 healed well and 10 cases ended up in wound dehiscence. Of them, one patient presented with only sero sanguinous wound discharge on suture removal and one patient with a superficial wound gape. Both did not require secondary suturing

and healed spontaneously. Of the rest, 8 patients required secondary suturing. One of these patients even developed complete wound dehiscence with severe wound infection. The wound swab for culture and sensitivity showed heavy growth of staphylococcus aureus. It was managed conservatively with daily wound dressings and Intra venous antibiotics till healthy granulation tissue appeared but eventually an uterocutaneous fistula developed when the patient started discharging menstrual blood in her first menstrual cycle following delivery (Figures 1-3). When secondary suturing was done the wound was closed with deep mattress sutures with prolene no 1 suture material and the fistula was left to heal spontaneously by keeping the patient amenorrheic with leuprolide depot preparations. By 3 months the fistula closed and conservative management of fistula combined with secondary suturing of wound was successful. Overall, 71.4% of LRTI patients had wound infections with a very significant p value (Table 2). Also, patients with wound infections with LRTI required resuturing in a statistically significant number (Table 3). Even UTI cases had an insignificant number of wound gapes. Of the 11 patients with urinary tract infections, 1 patient had cystitis and 1 had pyelonephritis. Both these patients had good wound healing. Of the rest, 2 patients had wound infections of which only 1 required resuturing which were no statistical significance (Table 3). A case of Dengue fever was diagnosed with platelet count 39,000 cells/mm³ had wound dehiscence with

	Total Cases (n=79)	Wound Infection (n=15)	No Wound Infection (n=64)	p-value
Age (years)	Mean 22.944 ± 2.54SD	22.93 ± 2.86SD	22.94 ± 2.48SD	0.96
Socioeconomic Status	(n=79) Middle-38 Lower-41	8 7	30 34	0.96
Weight (kg)	Mean- 54.456 ± 2.03SD	54.483 ± 2.09SD	54.322 ± 2.43SD	0.87
BMI	Mean-19.32 ± 1.87SD	19.45 ± 2.34SD	19.41 ± 2.41SD	0.43
Gestational age at caesarean delivery	Mean-38.12 ± 2.0S.D	38.09 ± 2.54SD	38.13 ± 2.48SD	0.38
No of caesarean	(n=79)			
Primary	27	8	19	0.12
Secondary	38	7	31	
Type of LSCS	(n=79)			
Elective	42	6	36	0.22
Emergency	37	9	28	

Table 1: Demographic and Obstetric Characters of patients in the study.

Infection	Wound healed	Wound not healed	Total	Chi Square value	p-value
	(n=57)	(n=15)	(n=79)		
Upper Respiratory tract Infection	13	2(13.22%)	15	0.09	0.75
Lower Respiratory Tract Infections	4	10(71.42%)	14	26.97	<0.001
Urinary Tract Infection	10	2(16.67%)	12	0.05	0.81
Others				1.15	0.29
Malaria	2	0	2		
Typhoid	3	0	3		
Dengue	0	1	1		
Chicken Pox	4	0	4		
Hepatitis A	1	0	1		
Hepatitis B	4	0	4		
Mumps	1	0	1		
Genital Herpes	2	0	2		
Syphilis	1	0	1		
Molluscum Contagiosum	1	0	1		
Gastroenteritis	4	0	4		
Mastitis/ Breast	4	0	4		

Table 2: Distribution of infections in cases and their outcome.

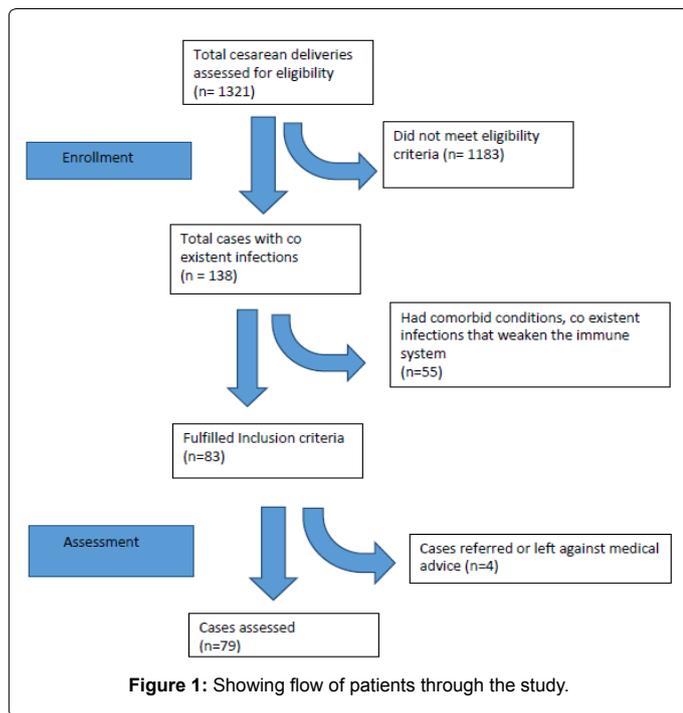


Figure 2: Showing wound dehiscence in a patient with LRTI who underwent cesarean delivery with utero cutaneous fistula and arrow pointing at menstrual blood coming out of it during patient's menstrual cycle.



Figure 3: Showing wound infection and dehiscence in a patient with LRTI after cesarean delivery.

about 30 ml sero sanguinous collections within. Her wound swab for culture and sensitivity showed no growth and eventually the wound healed after secondary suturing. All Cases of malaria, typhoid, and chicken pox healed well. Patients with Mastitis, breast abscess also had no incidence of wound infections in the present study. Minor infections like ASOM, periodontitis, gastroenteritis, conjunctivitis and paronychia also healed well. One case of mumps parotitis was included

in the present study. She developed bilateral parotid swellings on the second post-operative day with fever and rash. She also recovered well and was discharged on seventh post-operative day after suture removal. Also, two cases of genital herpes who were started on acyclovir pre operatively, were operated electively had no surgical site infection. One case of syphilis which had positive VDRL was taken up as an emergency for fetal distress and on third post-operative day had TPHA antibodies positive. She received Injection Benzathine penicillin 2.4 million unit IM route on third post-operative day and also had good healing of post-operative wound. Another important analysis was if the timing of co-existent infection i.e. early (upto 4th post-operative day) and late infections (after 4th post-operative day) had any bearing on the wound healing. Although, the incidence of wound infection seemed much higher in early infections, it was found to be statistically insignificant on analysis (Table 4).

Discussion

The possibility of a wound infection is a fear that resides in the minds of all clinicians after every Also another well-known fact is that pregnancy is an immune compromised state. It occurs because many modifications take place in cell mediated immune system in pregnant women [4]. This predisposes the woman to suffer from several infections. When the presence of co-existent infections adds to the stress of wound healing after a cesarean delivery, serious consequences may occur. Whether this is only a hypothesis or it is what evidence based medicine proves is known little. Hence, this study was planned. Also, another important aspect of today's medicine is obtaining risk consent from the patients and their relatives for every surgery to protect doctors and organizations when litigations crop up. To explain the exact risk involved, we must have evidence based medicine that quotes exact incidences of wound infections in those who undergo surgeries and have co-existent infections [5]. Several studies have proven that cough can predispose to wound dehiscence [2] due to raised intra-abdominal pressure but the present study has noted that LRTIs cause increased incidence of wound infection also. Many post-operative wounds heal usually without re suturing but cases of wound infections with LRTI significantly require re suturing. Studies on pregnancy with pneumonia have shown increased incidence of antenatal complications and adverse pregnancy outcome [6], although no study to the best of our knowledge quotes the exact incidence of wound infection in patients with LRTIs undergoing cesarean sections. Other reports on cesarean section in patients with malaria, typhoid and varicella zoster have shown similar results as in the present study [7-9]. But the limitation of the study is that physiological changes of pregnancy and postpartum period could have had some unknown impact on these co-existing infections, thus influencing the results and observations indirectly.

Infection (n-15)	Resuturing Not done (n=4)	Resuturing Done (n=11)	Chi Square	P-value
URTI	1	1	0.43	0.81
LRTI	2	8	27.18	<0.001
UTI	1	1	0.31	0.86
Others	0	1	1.1	0.57

Table 3: Cases of wound Infections and need for resuturing of wounds.

Time of Infection	Wounds Healed (n=64)	Wounds not healed (n=15)	Chi Square Value	P Value
Early	36	11	1.191	0.275
Late	28	4		

Table 4: Distribution of cases according to the timing of Co-existent Infections and their relation to the outcome.

Conclusions

1. Lower respiratory tract infections had the highest incidence of wound infections, discharges and dehiscence. Other co-existent infections did not influence the healing of surgical site.
2. Wounds which did not heal well among patients with Lower respiratory Tract Infections required resuturing in a significant number.
3. There is no impact on the timing of co-existent infections on surgical site healing.

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Declarations

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