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Is Presence of Fluid in Uterus or Peritoneal Cavity Forty Eight Hours After Caesarian Section Correlated with Post-Operative Morbidity?

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ABSTRACT

Objective: To study the association of fluid in uterus or peritoneal cavity forty-eight hours after caesarian section with post-operative morbidity.

Study Design: Prospective Analytical Study

Place and Duration of Study: Department of Gynecology and Obstetrics, Combined Military Hospital Bahawalpur, Pakistan from Jan to Nov 2022.

Methodology: Female patients of 20-40 years of age who developed fever, vaginal discharge or abdominal pain after LSCS, singleton pregnancy, more than 37 weeks of gestation with no use of prostaglandins and elective LSCS were included. The USG abdomen and pelvis was performed 48 hours after LSCS by a consultant Radiologist to see any pelvic collection. The collected data was analyzed on (SPSS) version 24.0.

Results: 60 patients were included in the study. Mean age of patients was 32.55 ± 5.96 years. 28 patients had pelvic fluid collection on USG after 48hours of surgery on USG abdomen and pelvis. Most common collection found was Bladder flap hematoma which was found in 13 (46.42%) patients. 33 patients developed fever, out of them 21(63.6%) had fluid collection which was statistically significant (p value 0.002).

Conclusion: USG abdomen and pelvis is an easily available and recommended investigation in patients presenting with complications in early postoperative period after LSCS thereby decreasing maternal morbidity. In patients presenting with fever in early postoperative time always rule out a pelvic/bladder wall or subfascial hematoma which may be the causative agent.

Keywords: Caesarean Section, Hematoma, USG Abdomen

How to Cite This Article: *Mahreen A, Zaineb S, Uzma S. Is Presence of Fluid in Uterus or Peritoneal Cavity Forty-Eight Hours After Caesarian Section Correlated with Post-Operative Morbidity? Pak Armed Forces Med J 2026; 76(3): 308-312. DOI: https://doi.org/10.51253/pafmj.v76i3.10047*

INTRODUCTION

Lower segment caesarian section (LSCS) and hysterectomy are the most commonly performed gynecological procedures all over the world.[1] LSCS is an essential procedure in case of complicated deliveries and pregnancy. Literature suggests that LSCS has more perinatal morbidity and mortality as compared to normal vaginal delivery.[2] LSCS has more chances of intrapartum blood loss and more morbidity when compared with vaginal delivery.[3] Postoperative fluid collections, thrombophlebitis and wound infections in early postoperative period are associated with febrile morbidity of patients.[4] Anemic or obese patients who had prolonged labor are more prone to post-operative morbidity.[2] Ultrasound examination 24-48 hours after LSCS may help to identify any fluid collection in uterus and pelvis which may help in early management of such cases. The management of such cases of postpartum fluid collection varies from oxytocin and prostaglandin infusion to fluid drainage and surgical procedures like hysterectomy.[5] Different guidelines support different surgical and conservative approaches to deal such cases of postpartum fluid collections (PPFC).[6] A better way forward in patients of PPFC is USG abdomen and pelvis after uncomplicated LSCS which may help in choosing the best treatment option in different cases provided that the normal findings after LSCS should be distinguished from substantial complications like thrombophlebitis, uterine scar dehiscence and hematomas. Endovaginal or trans-abdominal USG approach may be used to detect and drain the post LSCS collected fluid.[7]

Different studies have been conducted worldwide to know about the relationship between postpartum fluid collection and febrile morbidity. Some studies support that the large hematomas after LSCS are associated with fever and postoperative morbidity.[8] Some studies inferred that no such relation is present between postoperative fluid collection and postoperative morbidity after LSCS.[9]

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Received: 08 Mar 2023; revision received: 12 Aug 2024; accepted: 13 Aug 2024

This study was conducted to explore the feasibility of conducting USG abdomen and pelvis 48 hours after LSCS to detect fluid collection in pelvis and to know about its risk factors and association with postoperative morbidity.

METHODOLOGY

This prospective analytical study was conducted from Jan 2022 to Nov 2022 in Department of Gynecology and obstetrics at Combined Military Hospital, Bahawalpur Pakistan. The study commenced after getting approval from hospital ethical committee under ERB no (A/28/EC/325/2021). A sample size of 60 patients was calculated by using WHO calculator by keeping level of significance 5%, Power of study was 80% and anterior wall thickness of uterus at first and second ultrasound abdomen; 104+11 and 94+1110.

Inclusion Criteria: Female patients of 20-40 years of age who developed fever, vaginal discharge or abdominal pain after LSCS, singleton pregnancy, more than 37 weeks of gestation with no use of prostaglandins and elective LSCS were included.

Exclusion Criteria: Patients with twin pregnancy, emergency LSCS, complications after LSCS requiring surgical intervention and patients who developed post-partum hemorrhage were excluded.

Non-probability consecutive sampling technique was used to recruit the patients. Informed consent was obtained from those fulfilling the eligibility criteria. The ultrasound abdomen and pelvis were performed 48 hours after LSCS by a consultant radiologist using same ultrasound machine via trans-abdominal approach. Before performing the ultrasound, a thorough clinical examination was performed by post graduate trainee gynecologist to rule out PPH or any other complication. The temperature of the patients was monitored 8 hourly to document any febrile illness. Febrile morbidity was defined as temperature of >100^{o}F after 24 hours of surgery during hospital stay of patients.

The collected data was analyzed in in the statistical package for social science (SPSS) version 24.0. Descriptive statistics were calculated for qualitative and quantitative variables. Qualitative variables like gender and factors were measured as frequency and percentage. Quantitative variables like age were measured as mean and standard deviation. Chi square and independent t test were applied to know about the association of different variables. *p*-value ≤0.05 was taken as significant.

RESULTS

A total of 60 patients who met the inclusion and exclusion criteria were included in the study. Mean age of patients was 32.55±5.96 years. 12 patients (20%) had BMI less than 30 and 38 patients (63%) had BMI in between 30-35. In 28 patients' post-operative fluid collection was found after 48 hours of surgery on USG abdomen and pelvis.

34 patients (56.3%) had operative time of less than and equal to 45 minutes. All demographics are mentioned in Table-I.

Table-I: Demographic and Clinical Characteristics of the Study Participants (n=60)

Variable(s)		Values
Age (years)		32.55±5.96
Weight (kg)		75.20±8.78
Body mass index (BMI)	< 30	12(20.0%)
	30-35	38(63.3%)
	> 35	10(16.7%)
Gravidity	Primigravida	33(55.0%)
	Multigravida	27(45.0%)
Previous LSCS	Yes	16(26.7%)
	No	44(73.3%)
Operative time (mins)	≤ 45 mins	(56.7%)
	> 45 mins	26(43.3%)
	Yes	28(46.7%)
Post-operative collection	No	32(53.3%)
Post-operative serous discharge	Yes	8(13.3%)
	No	52(86.7%)
Post-operative fever	Yes	33(55.0%)
	No	27(45.0%)
Pain abdomen	Yes	28(46.7%)
	No	32(53.3%)
Vaginal discharge	Yes	5(8.3%)
	No	55(91.7%)

Post-operative fluid collection was found in 28 patients (46.7%) when USG abdomen was done 48 hours after surgery. 5 patients (8.3%) had vaginal discharge and 28 patients (46.7%) had pain abdomen on the post-operative period. Most common collection found was Bladder flap hematoma which was found in 13(46.42%) patients. Post-operative fluid collections with their quantity and type of collection are mentioned in Table-II.

Table-II: Data of Post-Operative Fluid Collections (n=60)

Variable(s)		n(%)
Post-operative fluid collection		28(46.7%)
Quantity of fluid collection (ml)	0-20 ml	13(46.42%)
	21-40 ml	11(39.28%)
	>40 ml	4(14.28%)
Type of fluid collection	Subfascial/ subcutaneous hematoma	11(39.28%)
	Bladder flap hematoma	13(46.42%)
	Pelvic collection	4(14.28%)

33(55%) patients had febrile illness in the post-operative time. Based on fever patients were divided into two groups. Group-A were patients having febrile illness and Group-B had no fever complaints in the post-operative time. Out of 33 patients who developed fever, 21(63.6%) had fluid collection positive which was statistically significant (*p*-value 0.002). Quantity of fluid collection has also significant relation with post-operative febrile illness (*p*-value 0.03). All other variables compared in both groups are mentioned in Table-III.

Table-III: Comparison of Variables Among Groups (n=60)

Variables		Group-A (Febrile) n=33	Group-B (Non-Febrile) n=27	*p*-value
Mean age of patients		33.00±6.07	32.00±5.89	0.900
Mean weight of patients		73.81±8.18	76.88±9.34	0.190
Post-operative fluid collection		21(75.0%)	7(25.0%)	0.002
Type of fluid collection	Subfascial hematoma	8(24.2%)	5(18.5%)	0.560
	Bladder flap hematoma	7(21.2%)	4(14.8%)	
	Pelvic collection	3(9.1%)	1(3.7%)	
Quantity of fluid collection	0-20 ml	10(30.3%)	3(11.3%)	0.030
	21-40 ml	8(24.2%)	3(11.1%)	
	>40 ml	3(9.1%)	1(3.7%)	

DISCUSSION

The findings of the present study highlight the important role of ultrasonography of the abdomen and pelvis as a readily available, non-invasive, and valuable diagnostic tool in the evaluation of patients presenting with complications during the early postoperative period following lower segment cesarean section (LSCS). Early identification of postoperative abnormalities is crucial for timely intervention and prevention of further maternal morbidity. Our results emphasize that, when performed by experienced personnel, ultrasonography is highly effective in detecting pelvic hematomas and other postoperative collections that may otherwise remain clinically unsuspected. The study further underscores the importance of maintaining a high index of suspicion for pelvic, bladder wall, or subfascial hematomas in patients who develop fever during the early postoperative period, as these occult collections may serve as an underlying source of infection and delayed recovery. Prompt ultrasonographic assessment in such cases can facilitate early diagnosis, guide appropriate management, and ultimately improve postoperative maternal outcomes.

LSCS is a commonly performed gynecological procedure and nearly one third of the births in United States are by LSCS.[11] There are many complications related to LSCS out of which post-operative hematomas are the most commonly encountered acute complications.[12] Bladder flap hematoma occurs between urinary bladder layer and lower segment of uterus and subfascial are the hematomas which are posterior to rectus sheath and anterior to peritoneum.[13] Due to an increase in rate of LSCS worldwide so its related complications; the role of radiologist has gained importance in order to differentiate between normal and abnormal findings within 24-48 hours of LSCS.

A study conducted by Antonelli *et al.*,[14] reported that approximately 48% of patients developed postoperative hematomas within 72–96 hours following LSCS, which is comparable to the findings observed in our study. These similarities suggest that postoperative hematoma formation remains a relatively common complication in the early post-cesarean period and reinforce the importance of vigilant postoperative monitoring. Likewise, Faustin D *et al.*,[15] reported a postoperative hematoma rate of 29% among patients undergoing LSCS. Although the incidence reported in their study was somewhat lower, it remains within a comparable range and supports the overall trend observed in our findings. The consistency of our results with previously published literature strengthens the validity of our observations and highlights the continued clinical significance of early detection of postoperative hematomas. These findings further emphasize the value of timely postoperative assessment, particularly with ultrasonography, to facilitate prompt diagnosis and management of hematoma-related complications, thereby reducing maternal morbidity and improving postoperative outcomes.

In our study 21 patients (63.6%) of fever had post-operative hematoma present which was statistically significant (*p*-value 0.002). These results are similar to results shared by Gemer o *et al.*,that sub-fascial hematomas are associated with post-operative febrile morbidity.[16] Faustin D *et al.*, also reported that post-operative febrile illness is associated with large hematomas (>90 ml) detected after LSCS15. Thomson AJ and Toglia MR in two different studies also reported similar results that post-operative pelvic fluid collection is associated with febrile illness.[9,17] The association between postoperative hematoma formation and febrile morbidity observed in our study is also supported by previous literature. Kehveci B *et al.*,[18] reported that approximately 23.3% of patients who developed postoperative hematomas following LSCS subsequently presented with fever, highlighting

the potential role of hematoma collections as a source of postoperative infection and inflammatory response. Similarly, Al-Inanay H *et al.*,[19] documented fever in 23.1% of patients with postoperative hematomas, further emphasizing the clinical significance of these collections in the development of postoperative febrile episodes. Comparable findings were reported by Chill HH *et al.*,[20] who observed postoperative hematomas in approximately 21% of patients, with nearly 20% of these hematomas becoming infected pelvic collections. Collectively, these studies demonstrate a consistent relationship between postoperative hematoma formation and infectious complications following cesarean section. The findings underscore the importance of early recognition and evaluation of hematomas, particularly in patients presenting with unexplained fever during the postoperative period. Prompt diagnosis through imaging modalities such as ultrasonography may facilitate timely intervention, prevent progression to infected collections, and contribute to improved maternal outcomes.

LIMITATION OF STUDY

We have only studied the patients with post-operative fever, pain abdomen and vaginal discharge. Post-operative complaints may be increased in next studies and their relations with post-operative hematoma can be studied too. Similarly, the treatment of post-operative hematoma was not our mandate in this study, which may be included in upcoming studies.

CONCLUSION

USG abdomen and pelvis is an easily available and recommended investigation in patients presenting with complications in early postoperative period after LSCS thereby decreasing maternal morbidity. In expert hands pelvic hematomas can be picked easily in early postoperative period. In patients presenting with fever in early postoperative time always rule out a pelvic/bladder wall or subfascial hematoma which may be the causative agent.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

AM & SZ: Data acquisition, data analysis, critical review, approval of the final version to be published.

SU: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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