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CAESAREAN SECTION;
SURGICAL TECHNIQUE

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ABSTRACT ... Objective: To determine what surgical techniques are used by obstetricians in Pakistan for caesarean section operations and to compare it with the recommendation, proposal and guidelines of Royal College of Obstetrician and Gynecologist (RCOG) and Cochrane Reviews. **Methods:** A questionnaire was set up regarding surgical technique used during caesarean section and one hundred obstetricians were part of study. **Setting:** Hospitals in two large cities of Pakistan i.e. Karachi and Rawalpindi were requested to fill them. **Period:** Jan 2009 to June 2009. **Result:** Substantial and remarkable and difference noted in the practice of caesarean section among the obstetricians. Certain practices and procedures performed by our obstetrician are same as proved to be beneficial and valuable based on evidence and recommended by the RCOG and Cochrane Data on pregnancy. **Conclusion:** We observed that our obstetricians follow different surgical techniques for performing caesarean section. Some of the techniques follow recommendations by RCOG and provide to effective and beneficial by cochrane data.

Key words: Cesarean section; technique, Pakistan.

INTRODUCTION

Caesarean section is the commonest and most important major operation performed on women in the world. The incidence varies in different part of world from 3 and 21% of all deliveries[1].

There are many possible ways of performing a caesarean section. Operation and operative techniques vary widely between obstetricians. The techniques used may depend on many factors including the clinical situation and the preferences of the operator. In the traditional technique the abdomen is opened by Pfannenstiel incision Uterus is closed in double layer, both visceral and parietal layer is closed, closure of rectus sheath is done by single vicryl suture, subcutaneous fat re-approximation using 2-0 plain catgut stitches, and individual silk sutures or metal staples for skin closure. The new modifications are Joel-Cohen incision of the abdominal wall, blunt extension of the initial uterine incision. Exteriorization of the uterus after manual removal of the placenta. One-layer continuous locked suture of the uterine lower segment, no visceral and parietal peritoneization, fascial closure by continuous polyglycolic un-locked suture individual silk stitches to the abdominal skin[2].

In Pakistan this is first of its kind to study the different surgical technique used by our obstetricians in performing this common procedure.

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The aim of study is to describe the techniques currently used by the obstetrician and to compare whether the techniques used by our obstetrician follows or in accordance and harmony with the RCOG and Cochrane recommendation.

METHODS

A questionnaire was prepared and 100 obstetricians working in different hospitals both private and government sector were requested to fill them. From January 2009 to June 2009. The obstetrician were residing in Karachi and Rawalpindi the two major cities of Pakistan. In the questionnaire they were asked about the year of graduation, duration of practice and place of working. Common indications of performing caesarean section and the technique which they follow for doing the lower segment caesarean section, such as preferable skin incision, instrument for skin incision, use of separate knives. Methods of extending the uterine incision, removal of placenta and repair of uterine incision and closure of the peritoneum. And also question regarding preferable anesthesia, antibiotics and anticoagulant. Information was also requested for suturing techniques and materials.

RESULT

Out of the 100 Obstetricians, a good number of them were practicing in government hospitals (70%). And a greater part being in the practice for longer than 10 years (40%). Obstetricians varies substantially in the method of abdominal entry 56 prefers the Joel Cohen method while 44 still goes for the conventional Pfannenstiel method.

Table II and III shows the number of respondents using each technique for caesarean section.

Compared to more use of diathermy by the general surgeons almost all obstetrician uses knife for skin incision. There is no difference in the use of single knife or separate knives. Regarding the extension of uterine incision 77% open it by blunt method while 11% uses sharp dissection for uterine extension.

Table-I. Technique of caesarean section	
Skin incision	
Joel Cohen	56
Pffenensteil	44
Both	-
Total	100
Instrument of skin incision	
Knife	99
Diathermy	01
Total	100
Separate Knives	
Yes	44
No	44
Sometimes	22
Total	100
Extension of uterine incision	
Blunt	70
Sharp	11
Both	09
Total	100
Removal of placenta	
Manual	16
Cord traction	83
Both	01
Total	100
Repair of uterine incision	
Extroversion	31
Introversion	63
Both	06
Total	100
Closure of peritoneum	
Visceral	09
Parietal	12
Both	42
None	37
Total	100

Table-II.	
Anesthesia	
Spinal	72
General	05
Both	13
Total	100
Antibiotic	
7 days	22
3-6 days	34
24-48 days	20
Single dose	04
Not answered	20
Total	100
Anticoagulant	
Yes	28
No	37
Sometimes	22
No answer	13
Total	100

As proved to be the safe method by various evidences majority removes the placenta by controlled cord traction, while 16% still removing the placenta manually.

Again considered to be a safe method by different analysis, more than half of our respondents do the intraversion repair of the uterus.
In contrast the dissimilarity is seen in the closure of the peritoneum both parietal and visceral. 42% closes both peritoneum's while 37% closes none.

A variety of materials were used for closure of skin. The most frequently reported are proline (55%), vicryl (18%) and silk (12%).None uses clips staples, nylon or plain catgut.

Variation seen in the use, choice and duration of antibiotics 22% uses for 7 days, 34% for 3-6 days while 20 % for 24-48 hours while 20% did not answered this question.

Discrepancy seen in the use and choice of anticoagulant also. A preponderance of participants using it in selected cases only. The preferable anticoagulant is Low Molecular weight Heparin (enoxaparin).

Table III shows the comparison of the surgical technique suggested to be followed by the Royal College of Obstetrician and Gynecologist and the Cochrane review and our obstetricians.

DISCUSSION

There are many ways of performing a caesarean section, and the techniques used depend on a number of factors, including the clinical situation and the preference and liking of the operator.

This survey shows that there is variable consensus among obstetrician in the techniques of caesarean section operation.

Our study found no evidence that those obstetricians who used a technique for which there is reliable evidence of efficacy and safety also used other techniques for which there is similar evidence-based support. This suggests that many of the obstetricians were either not aware of the available evidence in the recent literature or were aware of it but did not believe the results. Of course, there are a number of surgical techniques and practices relating to cesarean deliveries that have not been adequately studied. It is probably reasonable to assume that an acceptable level of care is established if 80% or more of obstetricians uses a practice or technique.

When comparison done with Royal College of Obstetrician guidelines and Cochrane evidence base recommendations we found that certain practices and procedures performed by our obstetrician are same as proved to be beneficial and valuable. We took 80% as acceptable level of care as cited in a study involving

Table-III. Comparison of our data with college and cochrane recommendation			
Technique	**RCOG recommendations 20**	**Cochrane recommendation**	**Our result**
Anesthesia	Spinal	No evidence that regional is superior over general anesthesia 21,22	82% using spinal
Joel Cohen	Yes	Yes 23	56% using Joel Cohen incision
Separate knives	No	Not mentioned	50% not using separate knives
Extension of uterine incision	Blunt	Blunt 24	77% using blunt
Removal of placenta	Controlled cord traction	-	83% controlled cord traction
Uterine repair	Intraperitoneal repair of uterus	Found no advantage of intraperitoneal repair over exteriorization of uterus for repair 25	73% intraperitoneal
Peritoneum closure	No (both)	No (both) 26	37% closing none
Subcutaneous tissue closure skin	Routine closure not recommended unless the woman has more than 2cm subcutaneous fat, No evidence	Yes it reduces wound complications 27 No evidence how the skin should be closed 28	49% not closing \ majority using proline
Prophylactic antibiotics Anticoagulant	Single does of first generation cephalosporin or ampicillin All	Recommend prophylactic antibiotics to all women 29 Insufficient evidence on best prophylaxis after c/s30	More than 80% using 4% using single dose. 34% using for 3-6 days 49% not sing at all

obstetrician in UK[3] Examples of these practices are use of spinal anesthesia, intraperitoneal repair of uterus, blunt extension of uterine incision, and removal of placenta by controlled cord traction. There are various abdominal incisions have been used for caesarean delivery These include vertical (midline and Para median) incisions and transverse incisions (Pfannenstiel, Maylard, Cherney, and Joel-Cohen). However the lower abdominal transverse incision is adequate for the vast majority of caesarean operations.

In our study we compare Joel Cohen with Pfannenstiel incision. Pfannenstiel is the traditional lower abdominal incision for caesarean delivery.

Joel Cohen incision for abdominal entry during caesarean section though suggested being a safe, quicker having shorter delivery /extraction and operative time[4,5,6] this practice is being followed by only 56% of our obstetricians.

Use of separate knives though not recommended by college is still being used by 50%of our obstetricians.

Uterus can be repaired either in situ or exteriorization of the uterus done. Exteriorization of the uterus i.e. the temporary removal of the uterus from the abdominal cavity to facilitate and assist repair of the uterine incision has been postulated as a valuable technique. This is mainly done when the exposure of the incision is difficult

and there may be tearing or extension of the uterine angle or there my be problems with homeostasis.

However, uterine exteriorization carries some risk and may cause nausea and vomiting with uterine traction, haemodynamic instability, exposure of the fallopian tubes to unnecessary trauma, and potential infection. A study done in Canada[7] also showed that women having exteriorized uterine repair had significantly more post delivery nausea or vomiting than those undergoing in situ repair (odds ratio [OR], 2.95; 95% confidence interval [CI], 1.04—8.34). The risk of tachycardia also was elevated in the exteriorized group also pain and hypotension were more frequent in the exteriorized group[6] Ezechi OC Kabs[8], favored exteriorization of uterus they demonstrated uterine exteriorization and in situ repair have similar effects on peri-operative caesarean section morbidity and advocate exteriorizing the uterus at caesarean section a valid option.

In another study[8] the author concludes that with effective anesthesia, exteriorization of the uterus is not associated with significant problems and is associated with less blood loss So far, few clinical trials have been conducted comparing uterine exteriorization with intra-abdominal closure of the uterus. Due to lack of agreement therefore wide variation in practice is seen. The RCOG and some other analytics however considered intraperitoneal repair a safe and secure method of uterine repair. More than half of our respondents do the intraversion repair of the uterus during caesarean section. Traditionally both visceral and parietal peritoneum were used to closed during caesarean section and it was used to considered as the standard practice. Various studies have however shown that peritoneum should be left open. The advantages clamed are shorter time and hospital stay[10] lower incidence of immediate postoperative morbidity including a reduced postoperative infection rates and lower incidence of long term morbidity with respect to adhesion formation and intestinal obstruction[11]. And lower use of analgesia and postoperative pain[12]. Therefore, it is recommended as part of the RCOG and NICE guidelines for Caesarean section[13,14,15] and also by the Cochrane pregnancy data[26].

However there are opponents of this practice as according to them there is an increase in the incidence of postoperative bowel adhesions if the visceral and parietal peritoneum left un-sutured. Similarly Zhu Yiyang[16] and Weerawetewat[17] showed that closure of peritoneum protect against adhesions formation. Comparable results were also found by others[18].

Only 37% of our obstetrician not closing the peritoneum at all some closing visceral some closing parietal while 42% closing both.

Surgeons vary in closure of subcutaneous fat also. It may be closed (sutured), or left unsutured with the wound being closed by suturing the skin. In our study we see clear variation in practice between obstetricians: 40% stated that they always closed the fat layer, 5% sometimes closed it, 45% never closed it.

Prophylactic antibiotics have been used in patients undergoing cesarean section since long time and there is no doubt that its use has led to a statistically significant reduction in the incidence of febrile morbidity and serious infections postoperatively[28] the use of prophylactic antibiotics reduced the incidence of endometritis, febrile morbidity, wound infection[19].

The suggested antibiotics are broad spectrum penicillin and cephalosporin. The college recommend single dose of first generation cephalosporin and ampicllin. All of our responders used prophylactic antibiotics however great variations seen in the numbers of days the antibiotics was given and the choice of the brand.

CONCLUSIONS

There were wide variations and differences in the surgical techniques used by obstetricians for caesarean section operations. Very few practices recommended and approved to be safe by the Cochrane review and the guideline of the Royal College are practiced by our obstetrician. There is greater need that awareness and understanding for practices which are proved to be effective and useful should be enhanced.

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REFERENCES

1. Ana P. Betran a, Mario Merialdi b, Jeremy A. Lauer c, Wang Ding-Shun. **Rates of caesarean section: analysis of global, regional and national estimates.** Pediatric and Perinatal Epidemiology 2007; 21:98 - 113.

2. AG Ferrari, L.G. Frigerio, G. Candotti. Can. Joel -Cohen **incision and single layer reconstruction reduce cesarean section morbidity?** International Journal of Gynecology &Obstetrics 2001; 72:35-143.

3. Tully, Lucy; Gates, Simon; Brocklehurst, Peter; McKenzie-McHarg, Kirstie; Ayers, Sarah. **Surgical Techniques Used During Caesarean Section Operations: Results of a National Survey of Practice in the UK.** Obstetrical & gynecological survey 2002; 57: 725-726.

4. Franchi M, Ghezzi F, Balestreri D, Beretta P, Maymon E, Miglierina M, Bolis PF A . **Randomized clinical trial of two surgical techniques for cesarean section.** Am J Perinatal 1998; 15(10):589-94.

5. Wallin G, Fall O. **Modified Joel-Cohen technique for caesarean delivery.** J Obstetric Gynaecol. 1999 ; 106(12): 1329.

6. Ferrari AG, Frigerio LG, Candotti G, Buscaglia M, Perrone M, Taglioretti A, Calori G. Can Joel-Cohen **incision and single layer reconstruction reduce cesarean section Morbidity** J Gynaecol Obstet. 2001 ; 72(2): 135-43.

7. Siddiqui, Mughina; Goldszmidt, Eric; Fallah, Shafagh; Kingdom, John; Windrim, Rory; Carvalho, Jose C. **A. Complications of Exteriorized Compared With In Situ Uterine Repair at Cesarean Delivery under Spinal Anesthesia** Obstet Gynecol. 2007; 110:570-575.

8. Edi-Osagie EC, Hopkins RE, Ogbo V, Lockhat-Clegg F, Ayeko M, Akpala WO, Mayers FN. **Uterine exteriorization at caesarean section: influence on maternal morbidity.** Br J Obstet Gynaecol 1998;105(10):1070-8.

9. Wahab MA, Karantzis P, Eccersley PS, Russell IF, Thompson JW, Lindow SW. **A randomized, controlled study of uterine exteriorization and repair at caesarean section.** Br J Obstet Gynaecol. 1999; 106(9):913-6.

10. Franchi M, Ghezzi F, Raio L, Di Naro E, Miglierina M, Agosti M, Bolis P Joel-Cohen or **Pfannenstiel incision at cesarean delivery: does it make a difference.** Acta Obstet Gynecol Scand 2002: 81:1040-1046.

11. Nagele F, Karas H, Spitzer D, Staudach A, Karasegh S et al. **Closure or non-closure of the visceral peritoneum at cesarean delivery.** Is J Obstet Gynecol 1996; 174: 1366-70.

12. Hoberg KE, Aagaard J, Laursen H, Diab L, Secher NJ. **Closure versus non-closure of eritoneum at cesarean section—evaluation of pain. A randomized study.** Acta Obstet Gynecol Scand 1998 ;77(7):741-5.

13. Magann EF, Washburne JF, Harris RL, Bass JD, Duff WP,Morrison JC. **Infectious morbidity, operative blood loss, and length of the operative procedure after cesarean delivery by method of placental removal and site of uterine repair.** J Am Coll Surg 1995; 181: 517-20.

14. Royal College of Obstetricians and Gynecologists, 2002. **Peritoneal closure.** Clinical Green Top Guidelines. Guideline No. 15. Royal College of Obstetricians and Gynecologists.

15. Caesarean section Clinical Guideline No. 13.2004 National Institute of Clinical Excellence National Collaborating Centre for Women's and Children's Health Commissioned by the National Institute for Clinical Excellence.

16. Zhu Yiyang, Cai Qunxi, Wu Weiling **Closure vs. non-closure of the peritoneum at Cesarean delivery.** International Journal of Gynecology and Obstetrics 2006; 94:103—107.

17. Weerawetwat W, Buranawanich S, Kanawong M. **Closure vs. non-closure of the visceral and parietal peritoneum at cesarean delivery: 16 year study.** J Med Assoc Thai. 2004 Sep; 87(9): 1007-11

18. Myers S A, Bennett TL **Incidence of significant adhesions at repeat cesarean section and the relationship to method of prior peritoneal closure.**! Reprod Med 2005; Sep;50(9):659-62.

19. S. Bagrateea, J. Moodleya, I. Kleinschmidtb, W. Zawilski. **A randomized controlled trial of antibiotic prophylaxis in elective caesarean delivery.** British Journal of Obstetrics and Gynaecology February 2001, Vol. 108, pp. 143±14.

20. Caesarean Section, Clinical Guideline April 2004 National Collaborating Centre for Women's and Children's Health; Published by the RCOG Press at the Royal College of Obstetricians and Gynecologists, 27 Sussex Place,

Regent's Park, London NW1 4RG57 (11), November 2002, pp 725.

21. Afolabi BB, Lesi FEA, Merah NA. **Regional versus general anesthesia for caesarean Section.** Cochrane Database of Systematic Reviews2007 Issue 4.

22. Ng K, Parsons J, Cyna AM, Middleton P. **Spinal versus epidural anesthesia for Caesarean' section.** The Cochrane Database of Systematic Reviews 2008 Issue 2.

23. Mathai M, Hofmeyr GJ. **Abdominal surgical incisions for caesarean section.** Cochrane Database of Systematic Reviews 2007, Issue 1.

24. Dodd JM, Anderson ER, Gates S. **Surgical techniques for uterine incision and uterine closure at the time of caesarean section.** Cochrane Database of Systematic Reviews 2008, Issue 3.

25. Jacobs-Jokhan D, Hofmeyr GJ. **Extra-abdominal versus intra-abdominal repair of the uterine incision at caesarean section.** Cochrane Database of Systematic Reviews 2004, Issue 4.

26. Bamigboye AA, Hofmeyr GJ. **Closure versus non-closure of the peritoneum at caesarean section.** Cochrane Database of Systematic Reviews 2003, Issue 4.

27. Anderson ER, Gates S. **Techniques and materials for closure of the abdominal wall hi caesarean section.** Cochrane Database of Systematic Reviews 2004, Issue 4.

28. Alderdice F, McKenna D, Dornan J. **Techniques and materials for skin closure in caesarean section.** Cochrane Database of Systematic Reviews 2003, Issue 2.

29. Smaill F, Hofineyr GJ. **Antibiotic prophylaxis for cesarean section.** Cochrane Database of Systematic Reviews 2002, Issue 1.

30. Gates S, Brocklehurst P, Davis LJ. **Prophylaxis for venous thromboembolic disease in pregnancy and the early postnatal period.** Cochrane Database of Systematic Reviews 2002, Issue 2.57(11), November 2002, pp 725.

PREVIOUS RELATED STUDIES

1. Elahi N, Qureshi RI. Outcome of trial of vaginal delivery after previous caesarean section. Professional Med J Mar 1997; (4)1:29-37.

2. Amin S, Roohi M. Caesarean section in breech presentation. Professional Med J Mar 2002; (9)1:24-28.

3. Ali M, Hafeez R, Ahmad M. Maternal and fetal outcome; comparison between emergency caesarean section versus elective caesarean section. Professional Med J Mar 2005; (12)1:32-39.

4. Roohi M, Chaudhry RF. Myomectomy done during caesarean section. Professional Med J Jun 2006; (13)2:299-302.

5. Hassan S, Javaid MK, Tariq S. Emergency caesarean section; Comparative analysis of problems encountered between patients of elective caesarean section and patient for whom elective caesarean section was planned but ended up in emergency. Professional Med J Jun 2008;15(2):211-215.

6. Choudry A, Nausheen J, Afsheen A, Malik A, Masood S. Rising caesarean section rate; making sense of it, is it unavoidable. Professional Med J Mar 2010; (17)1:78-83.