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## RESEARCH ARTICLE

### EVALUATION OF POSTOPERATIVE PAIN AFTER PFANNENSTEIL KERR VERSUS MISGAV LADACH METHOD OF LOWER SEGMENT CAESAREAN SECTION

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#### ABSTRACT

**Background:** Pain post caesarean is discomforting and drives the mothers to seek help. It would be useful to know if any change in surgical technique could have effect on the post-operative pain which affects the woman's activities. Hence, the study was undertaken to note the difference in postoperative pain on performing lower segment caesarean section by Pfannensteil Kerr and Misgav Ladach method. **Method:** It was an interventional study done over one year in a tertiary care hospital. Detailed history, investigations, operative details and postoperative pain was recorded and analysed. **Results:** Women in the Pfannensteil Kerr method group had more postoperative pain P value was highly significant at 2 h ( $<0.001$ ), 8h ( $P<0.001$ ), 16h ( $P<0.001$ ), 24h ( $P=0.014$ ) and 32h ( $P=0.005$ ), 40 hour ( $P=0.027$ ) and 48h ( $P=0.032$ ). **Conclusion:** Misgav Ladach method was a better technique than Pfannensteil Kerr in terms of postoperative pain and comfort. Hence, it results in considerable reduction in maternal morbidity and better patient satisfaction level and thus should be the preferred method to perform caesarean section.

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## INTRODUCTION

Postoperative pain is one of the major discomforts which drive the caesarean mothers to seek help. The numbness around the incision and occasional aches and pains may last for several months. This interferes with mother infant interaction. Obstetricians are constantly striving to make caesarean section comfortable by less post-operative morbidity. A small change in surgical technique affects various factors. Performing the caesarean section by different techniques- Pfannensteil Kerr (PK) and Misgav Ladach (ML) may have different postoperative pain and comfort level. This may help decrease the need for pain medication and hospital stay, which could lead to a meaningful cost saving to the woman and the society too, given the large numbers of caesarean sections performed worldwide (Bamigboye and Hofmeyr, 2007).

**Aim:** The study was undertaken to find the association of the technique of surgery and postoperative pain. Mean duration of surgery was also noted.

## MATERIALS AND METHODS

This was a hospital based interventional longitudinal study conducted in a tertiary care hospital from 1st February 2017

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till 31st January 2018 The sample size was calculated at 80 % study power and alpha error of 0.05 assuming standard deviation of 1.55 in 24 hr VAS Score as found in reference study by Gencdal *et al.* (2016). For minimum mean difference of 1 in 24 hr VAS score to be detected, 38 patients in each group were required as sample size which was enhanced and rounded off to 40 patients in each group for study purpose. Women aged 18-35 years, Body Mass Index (BMI) 18.5-24.99kg/metre<sup>2</sup>, live singleton term pregnancy, primigravida undergoing caesarean section under spinal anaesthesia and willing to participate in the study and give consent and were randomly selected. Women with polyhydramnios, severe anaemia, any sign of sepsis, hypertensive disease of pregnancy, active cardiac, pulmonary, renal, hepatic or neurological disease or on drugs that cause sedation or who had undergone any abdominal surgeries in the past, were excluded. Women who had any intraoperative complications or postpartum haemorrhage were also excluded from the study. Written informed consent was taken from all women for the surgery and to participate in the study. In Pfannensteil Kerr (PK) technique a curved transverse supra-pubic incision in the abdominal skin, abdomen is opened by sharp dissection (Pfannensteil *et al.*, 1897). Transverse lower uterine segment incision was given, uterus repaired in double layer and peritoneum was closed (Kerr, 1926). In Misgav Ladach (ML) method, abdominal wall was opened by method described by Joel-Cohen *et al.* (1972) by transverse skin incision 5 cm above the symphysis pubis and blunt dissection of all

abdominal walls. Suturing of the uterus was done in one layer and peritoneum was left open (Enkin and Wilkinson, 2000). Detailed records of intraoperative and postoperative parameters were made. Postoperative pain assessment was done by using visual analogue scale (VAS) (Mehack, 1971). Data collected was analysed. Pearson correlation coefficient and unpaired t test were used for statistical significance and P value <0.05 was taken as significant.

## RESULTS

The study comprised of two groups of forty women each. In group A, lower segment caesarean section was done by Misgav Ladach technique group-B by Pfannensteil Kerr method. Women in the ML group had lower pain score as compared to PK group. The difference in mean VAS score between ML technique and PK method was highly significant in the first 48 hours. P value was highly significant at 2 h (<0.001), 8h (P<0.001), 16h (P<0.001), 24h (P=0.014) and 32h (P=0.005), 40 hour (P=0.027) and 48h (P=0.032) Table 1. The mean age of our study participants was 24 years. 89% of the women were in the age group of 18-27yrs. Both groups were comparable in distribution for age with insignificant P value. The difference in mean VAS score at 24hours was statistically significant in all the age groups between ML and PK group but there was no significant change in the mean VAS score within different ages of same group (MML or PK). Thus, age had no correlation with the pain score Table 2. Most women belonged to lower and middle socioeconomic class. Very few women were from the higher socioeconomic class. The distribution of women among the ML and PK group in various socioeconomic classes was similar. The mean VAS score at 24 was significantly lower in the ML group than PK group in all the socioeconomic level, but in this too (ML), women of higher socioeconomic status had lower score.

**Table 1. Comparison of visual analogue scale in post operative period**

Time	VAS Score		P value*
	Group A (N=40)	Group B (N=40)	
2 hours	3.7 ± 1.3	6.8 ± 1.6	<0.001 (S)
8 hours	2.3 ± 1	4.9 ± 1.6	<0.001 (S)
16 hours	1.2 ± 0.7	3.6 ± 1.5	<0.001 (S)
24 hours	0.9 ± 0.8	2.4 ± 1.2	0.014 (S)
32 hours	0.6 ± 0.7	1.7 ± 1	0.005 (S)
40 hours	0.5 ± 0.7	1.4 ± 1.1	0.027 (S)
48 hours	0.3 ± 0.6	1.2 ± 1	0.032 (S)

\*p value calculated using Mann Whitney test

Group A = Misgav Ladach Group B= Pfannensteil kerr

**Table 2. 24 Hours vas score in relation to age**

Age (years)	Mean VAS Score 24 Hours Post Operatively		P value
	Group A (N=40)	Group B (N=40)	
18 – 22 years	1.1 ± 1	2.23 ± 1.24	<0.001 (S)
23 – 27 years	0.91 ± 0.7	2.5 ± 1.29	<0.001 (S)
> 27 years	0.83 ± 0.41	1.67 ± 0.58	0.038 (S)
r value	-0.064 (NS)	0.067 (NS)	

**Table 3. 24 Hours vas score in relation to socio-economic status**

Socio Economic Status	Mean VAS Score at 24 Hours Post Operatively		P value
	Group A (N=40)	Group B (N=40)	
Lower	1.24 ± 0.90	2.2 ± 1.3	0.018 (S)
Middle	0.7 ± 0.56	2.44 ± 1.23	<0.001 (S)
P value	0.025 (S)	0.557 (NS)	

**Table 4. 24 Hours vas score in relation to literacy status**

Literacy status	Mean VAS Score 24 Hours Post Operatively		P value
	Group A (N = 40)	Group B (N = 40)	
Upto primary	1.5 ± 1.2	2.2 ± 1.6	0.438 (S)
Upto secondary	1.0 ± 0.67	2.5 ± 1.27	<0.001 (S)
> Secondary	0.6 ± 0.51	2.32 ± 1.17	<0.001 (S)
P value	0.039 (S)	0.911 (NS)	

In PK group there was no significant change in the mean VAS score with change in socioeconomic level Table 3. Almost 80 % of women in our study were educated higher than primary level. This was because, only women who were able to understand the study and comprehend the VAS score were included in the study. Both the ML and PK group were comparable regarding the distribution according to the literacy level. The mean VAS score at 24 hours was statistically less in the ML group in all the women. In PK group, with change in literacy level, there was no statistically significant change in the mean VAS score but in ML group, with increasing education level, the pain score decreased Table 4.

## DISCUSSION

The difference in mean VAS score after ML technique was significantly lower than PK at all times in the first 48hours. Gencdal *et al.* (2016) also compared the postoperative pain, between the PK and MML and concluded that the ML method had advantages over the PK method of significantly reduced postoperative pain. Moradan *et al.* (2016) and Fatušić *et al.* (2011) also compared outcomes between the PK and the MML techniques in terms of analgesic use during the post-operative period and they all found score significantly lower in ML than Hofmeyr *et al.* (2010) compared the effects of opening the abdomen by Joel-Cohen–based incision with Pfannensteil incision and found that it was associated with reduced duration of postoperative pain and need of analgesic injections. Iftikhar *et al.* (2010) evaluated the effect of opening the abdomen by Joel-Cohen incision used in ML and single layer locked closure of uterus during caesarean section in terms of intraoperative and postoperative complications and concluded that Joel-Cohen incision was associated with less post-operative pain. Agarwal *et al.* (2015) assessed the effect of nonclosure of peritoneum at caesarean section as compared to peritonization and stated that post operative pain was significantly shorter in nonclosure group. They recommended non closure of peritoneum at caesarean section as done in ML technique of caesarean section. Since most tissues have a certain amount of elasticity, the nerve fibers and blood vessels remain intact and are moved aside to form the opening through which the lower segment of the uterus can be reached, Thus less damage is inflicted on the tissues during ML method. This results in less trauma and therefore, less post-operative pain (Gencdal *et al.*, 2016). It may also be due to less manipulation of parietal peritoneum, which is sensitive to pain. In addition, clots collected in the closed peritoneal space behind uterovesical fold could be a significant factor for postoperative pain in peritoneal closure groups (Fahmy *et al.*, 2015). In ML method, peritoneum is left open. Peritoneum is a highly sensitive epithelial lining and responds strongly against any foreign material, releasing many pain mediating cytokines and interleukin causing increased postoperative pain. In contrast to epidermal repair where healing occurs gradually from wound borders, peritoneum heals simultaneously throughout the wound because mesothelial cells initiate multiple sites of repair. If the peritoneum is left open, spontaneous reperitonealisation

will appear within 48-72 hours after injuring the peritoneum with complete healing after five to six days (Gencdal *et al.*, 2016). Suturing of peritoneum tends to cause tissue ischemia, necrosis, inflammation, and foreign body reactions. The peritoneal injury underlying these noxious stimuli evokes a serosanguinous inflammatory reaction that leads to fibrin deposition and early formation of adhesions. This increases the tissue reaction locally and increases the requirement of analgesics (Farooq *et al.*, 2003). Mean age of our study participants was 24 years In Rajasthan, the mean age of marriage is 20.5 years (Census of India, 2011) and since we had selected only primigravida, the mean age was low and we found no correlation of age with pain. The women of lower socioeconomic class were more as they visit government hospitals due to free medical facilities under Janani Shishu Suraksha Karyakram (Press Information Bureau, GOI). In PK group, pain score was higher but there was no correlation with socio-economic or literacy levels. Women of higher socioeconomic status had lower score in ML group. Discussion with them revealed that they had analysed and concluded by themselves that this small amount of pain would be there since surgery has been done and tolerated it better. Similarly, educated women were more psychologically prepared and some had even read about the surgery thus perceived the same pain as lower. Few women who had experienced labour pains prior to surgery felt that pain after caesarean section was much lower than what they were expecting.

#### Key points

- Misgav Ladach method was a better technique than Pfannensteil Kerr in terms of postoperative pain resulting in better patient satisfaction level
- Education helped in preparedness and better acceptance of pain
- It should be the preferred method to perform caesarean section as it reduces maternal morbidity

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