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Original Research Article

Effect of chewing gum on bowel recovery following caesarean section: a randomized controlled trial

Gayathri R.[1], Haritha Sagili[2], Rajagopalan G.[3], Elamurugan T. P.[3]*

[1]Department of Emergency Medicine, Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry, India
[2]Department of Obstetrics and Gynaecology, Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry, India
[3]Department of Surgery, Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry, India

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***Correspondence:**
Dr. Elamurugan T. P.,
E-mail: elamurugantp@gmail.com

ABSTRACT

Background: Postoperative ileus is the most frequent complication of any abdominal surgery. In case of patients who under caesarean sections it adds to the prolonged hospital stay and morbidity. Chewing gum acts similar to sham feeding has been proven to hasten return of gastrointestinal motility in non-obstetric abdominal surgery. To study the effectiveness of chewing gum on recovery of bowel function following Caesarean section.
Methods: This study, a randomized controlled trial was conducted in the Department of Obstetrics and Gynecology, JIPMER over a period of 2 months. Age, parity and details of patients who underwent caesarean section (type/indication/duration) were noted. They were randomised and allocated into two groups, group a (gum chewing group) and group B (control group). Using a verbal questionnaire time of first feeling of hunger, first passage of flatus and first passage of feces were noted.
Results: Mean time of first passage of flatus in group 1 (gum chewing) was 16.04±5.7 as compared to 22.05±4.8 in group 2 (standard care) and the difference was found to be statistically significant ($p<0.01$). Mean time of first passage of feces in group 1(gum chewing) was 27.08±3.2 as compared to 32.04±4.3 in group 2 (standard care). None of the patients in our study had any side effects with use of chewing gum.
Conclusions: Chewing gum significantly improves bowel motility when administered to patients following caesarean section and may help.

Keywords: Post-operative ileus, Bowel motility, Chewing gum

INTRODUCTION

Caesarean section (CS) is the most common major surgery in the world and the rates are increasing.[1] Postoperative ileus is an impaired condition of gastrointestinal motility defined as the interval from surgery until the passage of flatus or stool and the tolerance of an oral diet, that should occur within the fourth postoperative day and complicates up to 20% of caesarean delivery.[2] It can lead to abdominal distension, vomiting, postoperative pain/discomfort and prolongation of hospital stay thus resulting in significant morbidity.[3] Many methods have been advocated to speed bowel recovery after caesarean delivery such as ambulation, early hydration and chewing gum.[4] Chewing gum acts similar to sham feeding and activates the cephalic vagal pathway which results in both humoral and nervous stimulation of bowel motility. It has been proven to hasten return of gastrointestinal motility in non-obstetric abdominal surgery.[5]

Few studies in the recent past have shown the efficacy of chewing gum in increasing bowel motility in caesarean section patients.[6-13] Ciardulli in a metanalysis of 17 randomised controlled trials (RCT) has states that chewing gum is a safe and inexpensive intervention for early bowel recovery in caesarean delivery patients. They also suggested administering chew gum three times a day for about 30 minutes until the first flatus is associated with early recovery of bowel motility.[14] A systematic review and meta analysis done by Wen et in 2017 have concluded that though chewing gum hastens the intestinal function recovery after caesarean section, more larger-scale RCTs are still required to warrant the effect.[15] A meta-analysis of 5 RCTs by Hua-Ping found no benefit of postoperative gum chewing after caesarean section.16 Since there is conflicting results and there is lack of Indian data, this study was carried out to assess the effect of chewing gum on bowel recovery following caesarean section.

Aims and objectives

To study the effectiveness of chewing gum on recovery of bowel function following CS.

METHODS

This study, a randomized controlled trial was conducted in the Department of Obstetrics and Gynaecology, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) over a period of 2 months from May 2017 to June 2017. Women >18 years of age undergoing caesarean section under spinal anaesthesia were eligible for participation in the study. Patients with obstructed labour, diabetes/hypothyroidism, intra operative complications such as bowel injury, history of gastrointestinal surgery, and water and electrolyte disturbances, were excluded from the study. Age, parity and details of caesarean section (type/indication/duration) were noted. They were then randomised and allocated in one of the two groups namely, group A (gum chewing group) and group b (control group) using computer-generated numbers concealed in sealed envelope (SNOSE). Group A (gum chewing) patients received a pellet of standard branded chewing gum (ORBIT) 6 hours after the surgery, three times a day till passage of flatus. They were asked to chew the gum for half an hour without swallowing each time. Group B (control) patients received the standard postoperative care. Patients in both the groups were evaluated using a verbal questionnaire by the investigator regarding time of first feeling of hunger, first passage of flatus and first passage of faeces. Duration of stay in the hospital, side effects of chewing gum and patient compliance was also assessed in both the groups. Need for antiemetic agents and postoperative complications were also noted.

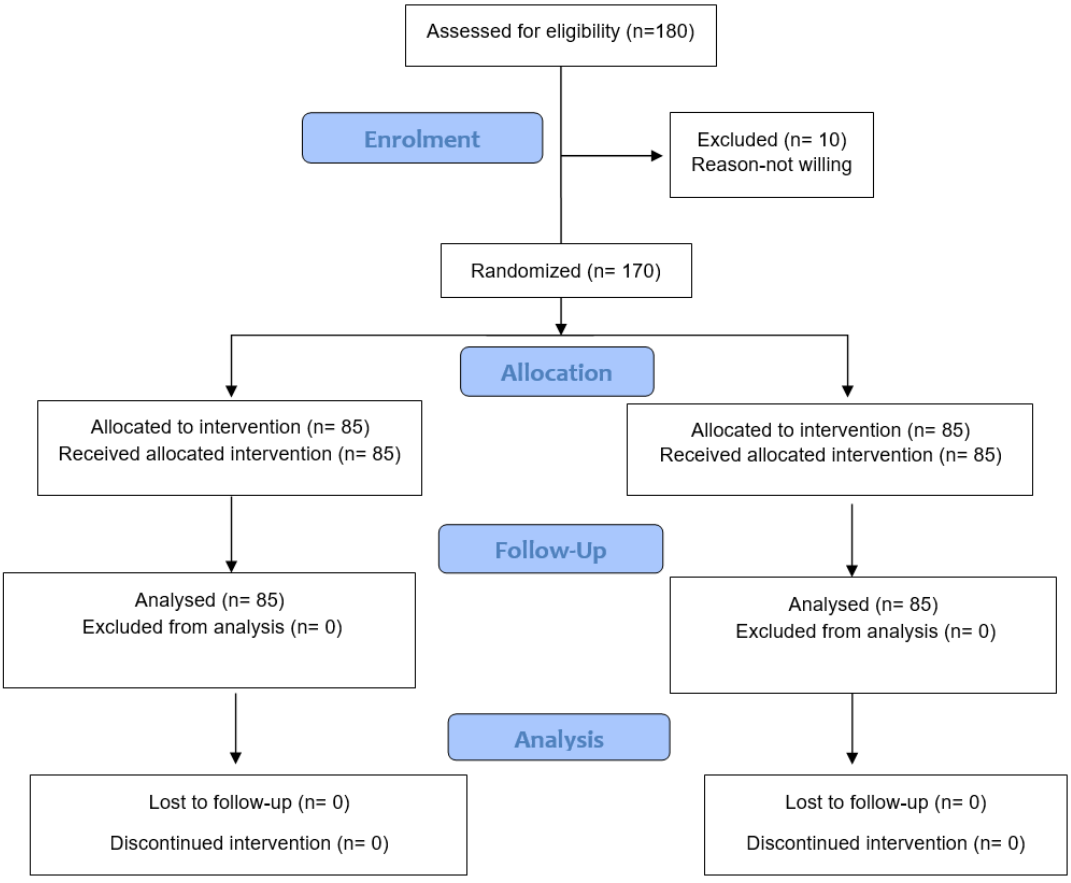

Figure 1: CONSORT flow diagram.

Statistical analysis

Sample size was calculated based on a multi-centric randomised controlled trial6 carried out to evaluate the efficacy of chewing gum on postoperative ileus following CS. Mean time of passage of flatus was assumed to be 24 hours and a mean difference of 6 hours was assumed to be of clinical relevance. Therefore, the mean time interval to the passage of flatus after gum chewing was proposed to be 18 hours in the intervention group. Assuming a common standard deviation of 12 hours, the sample size was calculated to be 85 participants for each group applying α=0.05 and 90% power. All statistical analyses were performed with Statistical package for the social sciences (SPSS) version 20.0. Continuous variables was expressed as mean±Standard deviation (SD) and analysed by unpaired t test. Categorical variables were expressed as proportions and chi-square test was used to assess significance. $p<0.05$ was taken as significant.

RESULTS

A total of 180 women who underwent caesarean section were found to be eligible, out of which 10 were not willing to participate in the study and were excluded. 170 women were recruited to the study. They were randomized into two groups as per protocol (85 patients in each group). Majority of the women belonged to the age group of 20 to 30 years in both the groups (70.5 % among chewing gum group and 64.5 % in standard group). Mean age was 27.44 years in group A which was comparable with mean age of 26.55 years in group b (Table 1).

Table 1: Demographic data of both groups.

Variables	Group 1 (gum chewing)	Group 2 (standard care)	P value
Age (years)	27.44±3.5	26.55±2.8	0.06
BMI	30.5±3.5	31.2±2.8	0.1
Parity	1.9±1.5	1.8±0.7	0.5
Duration of surgery (minutes)	43.5±7.3	42.5±8.2	0.4

Table 2: Details of Caesarean section.

Variables	Group A N (%)	Group B N (%)	P value
Types of CS			
Emergency	80 (93.5)	75 (88.5)	0.06
Elective	5 (6.5)	10 (11.5)	
Indication for CS			
Foetal distress	70 (82.5)	72 (84.5)	0.4
Others	15 (17.5)	13 (15.5)	
Duration of CS (minutes)			
<90	78 (92)	81 (94.5)	0.4
>90	7 (8)	4 (5.5)	
Mean duration	43.5	42.5	

Age distribution was similar in both the groups. Majority of the women in both the groups were multiparous (70.5% in group A and 68.5% in group B). Mean parity was 1.9 in the chewing gum group similar to 1.8 in the control group. There was no difference in parity between both groups. Overall, 91% of the women underwent emergency caesarean section. The most common indication for CS was foetal distress both in the chewing gum and control groups. 7 women in our study population had history of previous one CS. The mean duration of CS was comparable in both groups (43.5 minutes in group A and 42.5 minutes in group B). There was no statistical difference in type, indication and duration of CS between both groups (Table 2).

Table 3: Return of bowel function in the study population.

Variables	Group A N (%)	Group B N (%)	P value
Time of first feeling of hunger (hours)			
<10	11 (13)	9 (10.5)	<0.01
10-20	70 (82)	66 (77)	
>20	4 (5)	10 (11.5)	
Mean±SD	12.4±3.5	18.6±4.2	
Time of first passage of flatus (hours)			
<10	6 (7)	4 (5)	<0.01
10-20	66 (77.5)	62 (73)	
>20	13 (15.5)	19 (22)	
Mean±SD	16.04±5.7	22.05±4.8	
Time of first passage of faeces (hours)			
<20	21 (24.5)	14 (16)	<0.01
20-30	54 (64)	57 (67)	
>30	10 (11.5)	14 (17)	
Mean±SD	27.08±3.2	32.04±4.3	
Duration of hospital stay (days)			
≤7	34 (40)	23 (27)	<0.01
>7	51 (60)	62 (73)	
Mean±SD	7.0±2.0	8.0±1.5	

Majority (77-82%) of patients in both the groups had first feeling of hunger between 10-20 hours. The mean time to the onset of hunger was approximately 6 hours earlier in the gum chewing group which was statistically significant ($p<0.01$). Similarly, 73-77.5% of patients passed flatus in a range of 10 to 20 hours in both the groups. Mean time of first passage of flatus was 6 hours earlier in the gum chewing group in comparison to the standard care group and the difference was found to be statistically significant ($p<0.01$). Time of first passage of faeces ranged from 20-30 hours, in 64% and 67% of patients in chewing gum and control group respectively. Mean time of first passage of faeces was also 5 hours earlier in group A (gum chewing) when compared with group B (standard care) and there was a statistically significant ($p<0.01$) difference between the 2 groups (Table 3). Patients in the gum chewing group were discharged one day earlier when compared to the standard care group (Mean+SD, 7.0±2.0 versus 8.0±1.5).

Difference in duration of hospital stay between both the groups was found to be statistically significant with p<0.01. There were no side effects in the chewing gum group. 20% (17) of the women were not compliant with the method of chewing the gum. 6 women did not chew the gum for the entire duration of 30 minutes although they were instructed to do so. 5 women had spit out the gum pellet intact at the end of 30 minutes. Another 6 women fell asleep during chewing as they were tired due to sedation. None of the patients had nausea/vomiting requiring anti emetics nor did they have any postoperative complications until discharge from hospital.

DISCUSSION

Effect of chewing gum on bowel recovery in patients undergoing caesarean have been studied in 9 countries including China, Egypt, Iran, Nigeria, Philippines, Saudi Arabia, Thailand, Turkey and USA.[14,15,17] with conflicting results. To the best of our knowledge, this is the first study to have been carried out in the Indian population.

In the present study, both elective and emergency CS were recruited but the latter group formed the major part of the study population. In contrast almost half the studies in literature were on elective patients and few studies had no clear data or no information regarding type of CS and the others had a mixed population of emergency and elective CS.[17] In our study we had included women who had undergone caesarean section only under spinal anaesthesia because of the influence of general anaesthesia on delayed bowel motility. There is varied use of anaesthesia in the literature available on the use of chewing gum after caesarean section.[17]

In the present study, a sugar free flavoured standard chewing gum (ORBIT) was used similar to most other trials.[14,15,17] Studies have used different brands of chewing gum, some of which were of flavoured type.[6-13] One study has shown that xylitol ingredient in sugar free gum is associated with early recovery of bowel function and thus may be superior to non-xylitol gum.[13] Chewing gum was administered 6 hours after surgery in our trial. There is no clear standardisation regarding the time at which the chewing gum should be given to the patient in the postoperative period. In previous studies the time of administration varied from immediate postoperative period up to 12 hours post-surgery.[14,17] The duration of each chewing session was 30 minutes in our study similar to a range of 15 to 60 minutes in other studies. 14,17 Our women were asked to chew gum 3 times a day similar to most of the trials.[14,17] In some studies, the frequency of chewing has been as high as 5 to 6 sessions per day.[18,19] The overall duration of gum chewing in our study was 90 min per day, which was comparable to a range of 45 minutes to 180 minutes reported in other trials.[17] Only few studies had less than 60 minutes of total duration of gum chewing.[20,21]

In our study, the mean time to hunger was approximately 6 hours earlier in the intervention group as compared to control group. This finding is comparable to other studies which have shown reduction in time for feeling of hunger in post caesarean section patients ranging from 3-7 hours.[14,15] There was no significant benefit in the time to first feeling of hunger in a meta-analysis of 10 RCTs including 1659 women possibly because chewing causes a feeding feedback to the brain and early feeding can accelerate hunger.[15]

The mean time to first passage of flatus in our study was 6 hours earlier in the intervention group compared to the standard group which was found to be similar to other studies where average time to passage of flatus was six to seven hours shorter in the chewing gum group.[14,15,17] Also the mean time to first passage of faeces in our study was five hours early in the intervention group than standard group which is three to four hours lesser when compared to other systematic reviews which showed a 8-9 hour difference between the groups.[14,15,17] The duration of hospital stay was found to be reduced by 1 day in the intervention group in our study which is much earlier as compared to 0.30-0.39 days (8 hours) in recent meta-analyses.[14,15,17]

None of the patients in our study had any side effects with use of chewing gum. No previous studies have reported any adverse effect to chewing gum so far.[14,15,17] Only one study has documented 3 patients to have intolerance to chewing gum and thus less than 0.5% intolerance to chewing gum.[17,20] In our study 20% of the women were not compliant of chewing the gum, whereas none of the studies assessed or reported adherence to gum chewing which is in contrast to a cochrane review in which tolerance to chewing gum appeared to be high.[14,17] 5 women spit out the chewing gum pellet in spite of having been explained about the method. This is probably because of lack of understanding and not having used chewing gum before. Women who were randomised to chewing gum group had significantly higher satisfaction in a meta-analysis evaluating 3,041 women although another meta analysis reported that none of the 17 studies included in their review had assessed women satisfaction.[14,17] None of the women had nausea or vomiting and didn't need anti emetic agents within the first 72 hours after caesarean section in our study. Lesser number of episodes of nausea and vomiting have reported in the intervention group (relative risk (RR) 0.33, 95% Confidence interval (CI) 0.12 to 0.87).[14] Though two other previously conducted studies reported additional use of antiemetic medication in the post-operative period, a recent meta-analysis showed no significant difference in the use of antiemetic in intervention group.[9,17,22]

CONCLUSION

Chewing gum significantly improves bowel motility when administered to patients following caesarean section and may help in reducing postoperative ileus. Patients need to

be counselled and supervised during its use to improve compliance.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Degani N, Sikich N. Caesarean delivery rate review: an evidence-based analysis. Ont Health Technol Assess Ser. 2015;15(9):1-58.
2. Vather R, Trivedi S, Bissett I. Defining Postoperative Ileus: Results of a Systematic Reviewand Global Survey. J Gastrointest Surg. 2013;17:962-72.
3. Doorly MG, Senagore AJ. Pathogenesis and clinical and economic consequences of postoperative ileus. Surg Clin North Am. 2012;92:259-72.
4. Johnson MD, Walsh RM. Current therapies to shorten postoperative ileus. Cleve Clin J Med. 2009;76(11):641-8.
5. Li S, Liu Y, Peng Q, Xie L, Wang J, Qin X. Chewing gum reduces postoperative ileus following abdominal surgery: A meta analysis of 17 randomized controlled trials. J Gastroenterol Hepatol. 2013;28:1122 32.
6. Abasi Z, Alavi F, Salehian M, Fakari RF, Taherpour M, Farazmand T, et al. An investigation on the effect of chewing gum on gastrointestinal function after caesarean operation. Journal of Urmia Nursing & Midwifery Faculty. 2014;12(3):214-20.
7. Ajuzieogu OV, Amucheazi A, Ezike HA, Achi J, Abam DS. The efficacy of chewing gum on postoperative ileus following caesarean section in Enugu, South East Nigeria: a randomized controlled clinical trial. Nig J Clin Pract. 2014;17(6):739-42.
8. Jakkaew B, Charoenkwan K. Effects of gum chewing on recovery of bowel function following caesarean section: a randomized controlled trial. Arch Gynecol Obstet. 2013;288(2):255-60.
9. Kafali H, Duvan CI, Gozdemir E, Simavli S, OnaranY, Keskin E. Influence of gum chewing on postoperative bowel activity after cesarean section. Gynecol Obstet Invest. 2010;69(2):84-7.
10. Rashad WAE, Yousef SAAL. Effect of sugar less gum chewing on intestinal movement after cesarean section. Lif Sci J. 2013;10(4):3257-61.
11. Cevik SA, Baser M. Effect of bed exercises and gum chewing on abdominal sounds, flatulence and early discharge in the early period after caesarean section. J Clin Nurs. 2016;25(9-10):1416-25.
12. Sachin E, Terzioglu F. The effect of gum chewing, early oral hydration, and early mobilization on intestinal motility after cesarean birth. Worldviews Evid-Bas Nur. 2015;12(6):380-8.
13. Lee JT, Hsieh MH, Cheng PJ, Lin JR. The Role of Xylitol Gum Chewing in Restoring Postoperative Bowel Activity after Cesarean Section. Biol Res Nurs. 2016;18(2):167-72.
14. Ciardulli A, Saccone G, Di Mascio D, Caissutti C, Berghella V. Chewing gum improves postoperative recovery of gastrointestinal function after cesarean delivery: a systematic review and metaanalysis of randomized trials. J Matern Fetal Neonatal Med. 2017;6:1-9.
15. Wen Z, Shen M, Wu C, Ding J, Mei B. Chewing gum for intestinal function recovery after caesarean section: a systematic review and meta-analysis. BMC Pregnancy Childbirth. 2017;17(1):105.
16. Hua-Ping Huang, Mei He. Usefulness of chewing gum for recovering intestinal function after cesarean delivery: A systematic review and meta-analysis of randomized controlled trials. J Obstet Gynecol. 2015;54:116e-121e.
17. Morais PGE, Riera R, Porfírio GJM, Macedo CR, Vasconcelos SV, Pedrosa SA, Torloni MR. Chewing gum for enhancing early recovery of bowel function after caesarean section. Coch Dat Sys Rev. 2016;10: CD011562.
18. Lu L, Zhao A. "False eat" diet promote caesarean section with recovery of gastrointestinal function. Cinical study of functional recovery and lactation. Journal of Nurses Training. 2010;25(23):2158-9.
19. Wang X, Ren Y, Qin X, Dai X. Influence of sham feeding on motilin and evacuating time after accepting caesarean section. Chin Nurs Res. 2011;25(8):682-3.
20. Liang J, Gao T, Han W, Zhang Y, Liu S, Dai Q. Theclinical observation of enhancing recovery of gastrointestinal function after caesarean section by gum chewing. Journal of Tongji University. 2007;28(2):81-3.
21. Luo S, Wu C, Yang X, Lei L, Deng H, Li H. Effect ofchewing gum after caesarean section on restoration of gastrointestinal function. Chin J Mod Nurs. 2010;16(24):2948-9.
22. Shang H, Yang Y, Tong X, Zhang L, Fang A, HongL. Gum chewing slightly enhances early recovery frompostoperative ileus after caesarean section: results of a prospective, randomized, controlled trial. Amer J Perinatol. 2010;27(5):387-91.

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