Original Article

Role of Chewing Gum as A Predictor to Return of Bowel Activity After Caesarean Section

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Abstract

Objective: To compare the role of chewing gum as a predictor of bowel activity after the elective cesarean section in females presenting at term for delivery.

Methodology: Non-Probability, consecutive sampling was used this randomized controlled trial that was conducted in the Department of Obstetrics & Gynecology unit 5 King Edward Medical University, Lady Aitchison Hospital, Lahore. After taking approval from hospital ethical committee, 460 females fulfilling selection criteria were taken in this study. Informed consent was taken from the participants and all females were divided randomly into two groups by using random number table. Sugar-free chewing gum commercially available in the market was used as an intervention. In group 1, females were received chewing gum after 6 hours of elective C-section for 30 minutes every 6 hours (three times a day) and group 2, females in the postoperative period was not receiving chewing gum (control group). Then both groups were followed in the post-operative ward for assessment of passage of first flatus and defecation (as per operational definition).

Results: In group-1, duration of passing first flatus was 7.39 ± 1.98 hours and in group-2 (control group), duration was 12.80 ± 4.26 hours, the average duration of flatus was significantly lower in chewing gum group when compared with control, p-value < 0.001. In group1(chewing gum users) duration of defecation was 10.93 ± 2.78 hours and in the group- 2 (control) was 18.82 ± 5.46 hours, the average duration of defecation was significantly lower in chewing gum group when compared with control, p-value <0.001.

Conclusion: Current study result has illustrated that the gum chewing is quite beneficial to pass the flatus and defecation in less time duration. It must be included in standard postoperative care following a C-section as it is harmless and low-cost intervention. This might quickly recover the patient and reduce the time of hospital stay that can be executed in future.

Keywords: Pregnancy, gestational age, Cesarean section, Chewing gum, bowel movements, passage of flatus, defecation

Cite this article as: Sajid A, Butt A, Sajid A, Hanif A, Waseem T. Role of Chewing Gum as A Predictor to Return of Bowel Activity After Caesarean Section.J. Soc. Obstet. Gynaecol. Pak. 2017; Vol 7(3):119-123.

Authorship Contribution: [1] Concept and Idea, Data collection, literature review, [2,3]Active Participation in active methodology, helped in references, assisted in drafting the work, [4]Data analysis, [5]Final approval & critically revising.

Funding Source: none
Conflict of Interest: none

Received: May 28, 2017
Accepted: Sept 23, 2017

Introduction

Cesarean section (CS) is one of the most common surgery in females that is associated with central nervous system variations in postoperative period, that can lead to reduced bowel movements.[1-5] Conventionally oral feeding is avoided until postoperative ileus (PI) is resolved which is depicted by flatulence and/or bowel movement after CS. The enteral feeding is gradually expanded according to physician-dictated regimen [6, 7] Postoperative ileus or paralytic ileus is defined as "transitory interruption in the movement of gastric and bowel after surgery".[8, 9] The gastrointestinal motility can be delayed by several factors but the actual mechanism behind postoperative ileus is still unknown. Hence, it is needed to have a multimodal approach in order to decline the incidence. Postoperative ileus can be prevented through various medications as well as interventions.[10, 11]

The POI incidence and consequences followed by C-sections was considerably reduced when chewing gum was used for 30 to 60 mins for minimum 3 times/day.[12] Thus, chewing gum might be added and suggested in the hospital protocol used to manage postpartum care of C-sections cases.[13] Moreover it is suggested to use Chewing gum because it works, as sham feeding that is capable to stimulate the motility of gastrointestinal tract[14, 15] via recurrent activation of the "cephalic-vagal complex",[8, 16, 17] and it helps in early maternal bowl movements.[17-19] While few studies study reported no effect of chewing gum. [20, 21]

The rationale of this study is to compare the outcome with and without the use of chewing gum after planned cesarean section in females presenting at term for delivery. Literature has shown that chewing gum after cesarean section may be helpful in the prevention of postoperative ileus and patient can pass flatus and stool earlier than control (nothing given after surgery). But contradictions are present and described that there is no additional benefit of chewing gum. Furthermore, previous studies were conducted on small sample sizes (25-50 cases in each group in different studies). We took large sample size (460 cases) to get more precise and reliable results, which help us to confirm the additional benefits of chewing gum in terms of short duration of passage of flatus and defecation which in return may help in early recovery and short hospital stay, which can be implemented in future.

Methodology

The randomized controlled trial study was conducted in Department of Obstetrics & Gynecology, unit 5 King Edward Medical University Lady Aitchison Hospital, Lahore from 1:1:2016 to 31:12:2016.

230 females in each group are calculated with 95% confidence level, 80% power of the test and taking the magnitude of time required passing first flatus i.e. 18±5.3 hours with chewing gum versus 19.4±5.4 hours in control group after the elective cesarean section in females presenting at term for delivery.

Inclusion criteria: Females of age 18-35 years, of parity <5, planned to undergo elective cesarean section at term (gestational age>37 weeks on ultrasound and antenatal record).

Exclusion criteria:

- Previous history of severe constipation or take laxative for constipation
- Females with a history of gastroenteritis, inflammatory bowel disease or bowel obstruction.
- Females with chronic systemic problems i.e. diabetes (BSR>186mg/dl), HTN (BP≥140/90mmHg), abnormal renal function reports (creatinine>1.2mg/dl), abnormal liver function reports (AST>40IU, ALT>40IU), cardiovascular disease (abnormal ECG and medical record), autoimmune diseases (medical record)
- Females very lean (BMI<19kg/m^2)

Data Collection: After taking approval from hospital ethical committee, 460 females fulfilling selection criteria were selected from labor ward of Department of Obstetrics and Gynaecology, KEMU Lady Aitchison Hospital Lahore. Informed consent was taken and demographic information (name, age, gestational age, parity) was obtained. Then females were divided randomly into two groups by using random number table. In group 1, females were receiving chewing gum for 30 minutes after 6 hours of C-section every 6 hours (three times a day) after recovery from spinal anesthesia and group 2 not receiving chewing gum (control group). Then females were followed in the post-operative ward for assessment of outcome measures and were assessed in terms of time required for passing first flatus (that was defined as total duration/time required passing the first flatus after

cesarean in hours) and time required passing the first defecation [that was defined as total duration/time required passing the first stool (defecation) after caesarean in hours]. All this information was recorded in proforma by researcher herself (attached). Data was entered and analyzed in SPSS version 20. Quantitative data like age, gestational age and duration time from surgery till the first passage of flatus and first defecation was presented as a mean and standard deviation. Qualitative data like parity was presented as frequency. A t-test was used to compare the outcome in both groups. P value ≤ 0.05 was considered as significant.

Results

The mean age of all females was 27.18± 3.60 years, in Chewing group the mean age was 27.15 ± 3.66 years and in control groups mean age was 27.22±3.55 years. Mean age in both groups was same, p-value >0.05. According to parity, 116(25.22%) females had parity 1, 197(42.82%) had parity 2, 115(25%) had parity 3 and 32(6.95%) females had parity 4. The mean gestational age in group1 was 38.53 ± 1.55 weeks and in group 2 (control group) was 38.58 ± 1.45 weeks; the mean gestational age in both groups was statistically same, p-value > 0.05. In the group1 duration of passing first flatus was 7.39 ± 1.98 hours and in group 2 it was 12.80 ± 4.26 hours, the average duration of flatus was significantly lower in group 1 when compared with group 2 (control), p-value < 0.001. In chewing gum group duration of defecation was 10.93 ± 2.78 hours and in control group was 18.82 ± 5.46 hours, the average duration of defecation was significantly lower in chewing gum group when compared with control, p-value <0.001.

Discussion

Postoperative malfunctioning of the gastrointestinal tract is significantly associated with high morbidity and regarded as a chief factor in determining the hospital stay of the patient postoperatively. Multiple factors can cause postoperative malfunctioning of gastrointestinal tract e.g. response in the stress, interventions applied during operation, manipulation of the bowel, adhesions in case of repeat C-sections and duration of surgery. [22]

It has been reported that bowel motility and function are enhanced by gum chewing and early start of oral feeding can be well tolerated in the postoperative period. There is enough evidence of the beneficial effect of chewing gum, on the incidence of the POI in of colonic surgery. Sanjay Marwash and Sham Singla performed a prospective randomized control trial to study the role of gum chewing on the duration of postoperative Ileus following Ileostomy closure done for typhoid Ileal perforation. Reduction in the time was observed in passing 1st flatus and defecation "58.48±22.69hrs" and "84.96±38.28hrs", respectively while in control group it was reported as "73.12±25.63hrs" and "109.20±37.4hrs", respectively. There were significant difference between 2 groups (P=0.006 for flatus and 0.004 for defecation).[17]

Though, its effectiveness among female undergoing C-section remains ambiguous. In a study conducted by Harma M, revealed that in gum-chewing patients who underwent cesarean under general anesthesia, no difference occurred in the timing of first flatus or defecation in comparison with control (non chewing gum patients).[9,10.] On the contrary

Our study depicted a positive effect of chewing gum however, we differ in selection criteria from the Harma M, as his study population comprised of patients who underwent caesarian section under general anesthesia. On the other hand, we in our study randomized only those patients that had caesarian section performed under spinal anesthesia. The different type of anesthesia used might be a potential confounder factor in both the studies.

Table I: Comparison of different quantitative variables in both groups

Variables	Study groups	Mean	S.D	p-value
Age (years)	Chewing gum	27.15	3.66	0.846
	Control	27.22	3.55	
Gestational age (weeks)	Chewing gum	38.53	1.55	0.73
	Control	38.58	1.45	
Duration of flatus (Hours)	Chewing gum	7.39	1.98	<0.001
	Control	12.80	4.26	
Duration of defecation (hours)	Chewing gum	10.93	2.78	<0.001
	Control	18.82	5.46	

The comparable results are also reported by another study that has advocated the use of chewing gum in post C-section patients. Ledari et al. have also conducted a trial on the patients that underwent C section, and hence proved stimulatory effects of chewing gum on bowel function. A relatively small time was observed while passing 1st flatus and defecation "24.8±6.4hrs" and "30.7±5.9hrs", respectively when compared with controls "30±9.7hrs" and "38.4±8.9hrs". There was a significant difference in both groups (P=0.002 for flatus and 0.0001 for defecation).[18] Moreover, they have also reported that both groups had a similar demographic variable i.e. age of the females, BMI, parity, surgical duration, number of curettages and miscarriages, time of 1st feeding, serum intake quantity, and C-section type. Similar results in terms of maternal age, gestational age, and post-caesarean efficacy of chewing gum are also reported in our study. In addition to the prior mentioned study, Ledari et al. also advocated the evidence and revealed through another trial that the time noted for passage of 1st flatus and defecation was less with chewing gum ("25.02±5.8hrs" and "31.17±5.3hrs", respectively) while in control ("31.08±9.7hrs" and "40.08±8.8hrs", respectively). There was significant difference in two groups (P=0.003 for flatus and 0.000 for defecation).[23]

A local study was done on similar objective, they reported first bowel sound significantly lower in chewing gum group (21.39 ± 0.68h) versus non chewing gum group 28.27 ± 0.60 h. The mean duration of first passage of flatus in chewing gum group was also significantly lower than non-chewing gum group i.e. 25.94 ± 0.71 h versus 32.00 ± 0.77 hours. The mean duration of first defecation was 31.56 ± 0.81 h in chewing gum group and in non-chewing gum group was 41.28 ± 0.80 h. All parameters were significantly lower in chewing gum group than non-chewing gum group i.e. p-value < 0.05.[24]

A meta-analysis of six randomized controlled trials performed by Zung YP and Wang WJ showed quite encouraging results. Total of "939" females enrolled and the pooled results had shown that gum chewing was significantly better as compared to no gum chewing and less time was observed for first flatus "6.42hrs", and for first time bowel sound "3.62hrs", for first stool "6.58hrs" with hospital stay duration of "5.94hrs". Furthermore, no side effects of utilizing chewing gum is demonstrated in any study.[25] Therefore, oral feeding is customarily allowed by gynecologist among caesarean section patients after confirming the initiation of gut sounds, stool passage, and feeling of hunger postoperatively. Recovery of bowel motility is indicated by passing flatus and defecation. Several studies have reported that oral feeding prior of passing flatus or defecation can leads to an increase in the tissue injury, delayed wound healing, high rates of postoperative infection after C-section which subsequently elevates the parenteral support requirement that put extra load on the hospital as well as on the patient's family. Therefore, gum chewing is very beneficial and effective in the early return of bowel motility and quick recovery after C-section. Hence, the use of chewing gum can be recommended after C-section in future routine practice.[23, 25, 26]

Conclusion

The current study result has illustrated that the gum chewing is quite beneficial to pass the flatus and defecation in less time duration. It must be included in standard postoperative care following a C-section as it is harmless and low-cost intervention. This might quickly recover the patient and reduce the time of hospital stay that can be executed in future.

Disclosure: The article is based from the Thesis submitted to College of Physician and Surgeons Pakistan in 2016

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