Comparative Study between the Effect of Rectal Misoprostol and Gum Chewing on Intestinal Motility after Elective Caesarean Delivery Randomized Controlled Clinical Trial

Thesis

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Introduction

The number of caesarean sections performed each year is increasing at a dramatic rate all around the world. Postoperative care of these women is an important aspect and demands due attention. Hydration and nutrition are two essential components of postoperative care. Traditionally, postoperative hydration following caesarean section implied using 2–3 L of intravenous fluids in the first 24 h, thus providing for fluid lost during the surgery and the maintenance requirements ***(Horowitz, 1997).***

Traditionally postoperative oral intake is withheld until the return of bowel function. There has been concern that early oral intake would result in vomiting and sever paralytic ileus with subsequent aspiration pneumonia and wound dehiscence. However, supporting scientific evidence for this traditional practice is lacking and there are potential benefits from early postoperative oral intake ***(Charoenkwan et al., 2007).***

However, caesarean section may not disrupt bowel function at all. The review found the evidence from trials does not justify withholding food and drink after uncomplicated caesarean section. There is some evidence that early food and drink might speed bowel recovery so drinking and eating again soon after caesarean section

does not seem to cause women any problems, and may even speed recovery ***(Mangesi et al., 2002).***

Misoprostol, an analog of prostaglandin that has uterotonic properties, has also been demonstrated to be beneficial at a high dose of 1200 μg per day for a week or more in the treatment of chronic refractory constipation ***(Soffer et al., 1994) (Riviere et al., 1991).***

Although misoprostol is not used at such a high dose or for such a long duration in obstetric treatments, there are few studies on the possible affect that rectal dose might have on intestinal motility after surgery, which may favor early commencement of oral feeding and confer benefit on wound healing ***(Orji et al., 2009).***

Several alternative approaches have emerged in recent years in an attempt to provide early return of bowel function. One such approach is the use of a prokinetic agent such as erythromycin, cisaperide or metoclopramide ***(Traut et al., 2008) (Kehlet 2008).***

The use of chewing gum has emerged as a further, new novel and simple strategy for preventing postoperative ileus. Several studies have reported on the beneficial effect of using chewing gum after surgery to limit the incidence ***(Purkayastha et al., 2008) (Abd-El-Maboud et al., 2009).***

Aim of the Study

To compare the effect of rectal misoprostol versus gum chewing on intestinal motility after elective caesarean section in patients with early oral feeding.

Chapter (1)
Physiological Intestinal Changes during Pregnancy

Pregnancy is associated with normal physiological changes that assist fetal survival as well as preparation for labor.

The effect of progesterone hormone on gastrointestinal system

Pregnant women may suffer from a number of gastrointestinal symptoms, including reflux, nausea, vomiting, abdominal pain, bloating, and constipation, associated with smooth-muscle relaxation and elevated serum concentrations of progesterone ***(Chiloiro et al., 2001).***

The small intestine exhibits decreased motility during pregnancy. Lawson noted that the mean small bowel transit time significantly increased during each trimester (first trimester, 125 ± 48 min; second trimester, 137 ± 58 min; third trimester, 75 ± 33 min) and decreased back to normal levels postpartum. This increased transit time is related to elevations in progesterone levels during normal pregnancy and may

contribute to the increased symptoms of constipation in late pregnancy ***(Vanagunas et al., 2008).***

The many changes that pregnancy exerts on the colon lead to increased symptoms of constipation. The colon may be subject to the same decreases in motility that affect the other portions of the gastrointestinal tract. Progesterone has been shown to alter colonic transit time in rats. This effect, however, has not been shown in humans, because many studies show conflicting data regarding progesterone's effect on colonic transit time. The functional changes that occur with the enlarging uterus may mechanically limit colonic emptying and probably is the main reason for symptomatic constipation in late term. There is also a significant increase in water and sodium absorption secondary to the increased aldosterone levels during pregnancy, leading to reduced stool volume and prolonged colonic transit time ***(Vanagunas et al., 2008).***

Progesterone (P4) inhibits the gastrointestinal muscle contraction by down regulating Galpha (q/11) proteins that mediate contraction, by up regulating Galpha(s) proteins that mediate relaxation, and by altering the pattern of cyclooxygenase (COX) enzymes and prostaglandins. Gastrointestinal motility, food absorption, and lower

esophageal sphincter pressure are decreased during pregnancy, probably due to an increased level of plasma progesterone ***(Lind et al., 1968).***

Fifty-two percent of pregnant women first experience GERD in their first trimester, 24-40% experience it in their second trimester, and 9% in their third trimester ***(Praveen et al., 2013)***.

Both mechanical and intrinsic factors are involved in GERD. Abnormal esophageal motility, decreased lower esophageal sphincter (LES) pressure and increased gastric pressure contribute to GERD in pregnancy. Increased intra-abdominal pressure from the gravid uterus and displacement of the LES also contribute to GERD in pregnancy ***(Praveen et al., 2013).***

Other hormone may affect intestinal motility in pregnancy

It has been suggested, however, that, in addition to progesterone, other factors may also be important in mediating prolonged OCTT in late-phase pregnancy. Although the optimum rate of gastrointestinal transit is unknown, the higher frequency and severity of constipation during the third trimester imply the involvement of steroid and opioid peptide hormones ***(Chiloiro et al., 2001).***

Because current data support a concomitant release of gastrointestinal peptide hormones with changes in myoelectric complexes ***(Chiloiro et al., 2001).***

The sluggish gallbladder response and slower gastrointestinal transit during pregnancy suggest concomitant changes in the release of peptide hormones, such as bombesin, cholecystokinin (CCK), pancreatic poly-peptide (PP), peptide YY (PYY), and neurotensin (NT). Christofides and colleagues reported that motilin, a hormone known normally to stimulate smooth muscle and movement through the gastrointestinal tract, was inhibited in 37 pregnant subjects ***(Chiloiro et al., 2001).***

So gastrointestinal motility is reduced and transit time is consequently longer. This allows increased nutrient absorption and Constipation is common

Other factor may affect gastrointestinal motility in pregnancy

Because of decreased plasma gastrin concentration during pregnancy, there is reduction in the total acid content of the stomach. Gastric emptying time is significantly slower during labor and hence gastric volume is increased. Analgesic drugs will further increase the gastric emptying time. The enlarged gravid uterus divides the stomach into fundal and antral parts

and also increases gastric pressure. Serum glutamic oxaloacetic transaminase, lactic dehydrogenase, and alkaline phosphatase levels are elevated during pregnancy and labor, and the sodium Bromsulphalein excretion test is also often abnormal in the majority of parturient. Serum cholinesterase activity is reduced 24% before delivery and becomes lowest (33%) on the third postpartum day14. Even with this lower activity, normal dosing of succinylcholine for intubation (1 to 1.5 mg/kg) is not associated with prolonged neuromuscular blockade during pregnancy. Gallbladder function and emptying are impaired during pregnancy, and there is evidence that parturient may be more prone to gallstone problems ***(Rothstein and Rameau, 1993).***

Fetal growth in late pregnancy can cause intestinal malrotation. The antagonistic relationship between the fetus and the uterus can result in dextrorotation of the uterus ***(Hudson and Bowcock, 1994).***

These combined movements of the intestinal tract and uterus have been reported to impede onward movement of solid feces, obtrude defecations, and reduce intestinal transit time ***(Wald, 2003).***