

ORIGINAL ARTICLE

Color Doppler Misoprostol Response Study (CDMRS): An Evaluation Tool for Patients Awaiting Myomectomy



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Background: Uterine myomas (fibroids) are benign tumors of the uterus. Myomectomy, the surgical removal of myoma, is an important treatment option. The major complication associated with myomectomy is excessive bleeding. Many interventions have been used to reduce bleeding during myomectomy. Misoprostol produces uterine contraction, thereby reducing blood supply to the myometrium and in the myoma; it can be used as an alternative to uterine artery occlusion or paracervical tourniquet to reduce blood flow during myomectomy. The Color Doppler Misoprostol Response Study (CDMRS) is a study planned to assess the vascularity of the myoma in patients with fibroid uterus and note the changes after misoprostol administration.

Materials and methods: A baseline study of all the patients was done prior to insertion of misoprostol or placebo, and the largest selected fibroid in the patients with uterine fibroids was evaluated for its volume and perfusion by Doppler ultrasound. The resistive index (RI) was measured prior to and after administration of 800 μg misoprostol (4 tablets) per rectal insertion, after 20 minutes, and reevaluated 40 minutes postinsertion.

Results: Results from a *t*-test shows that the use of misoprostol significantly reduces the volume of fibroid from 0–20 minutes by t_{0-20} [mean difference = 40.3 cm^3 , confidence interval (CI) 30.6–49.9, $p = 0.000$] and t_{20-40} (mean difference = 36.2 cm^3 , 95% CI 30.7–41.6 cm^3 , $p = 0.000$). In the control group receiving four tablets of placebo no significant difference was noted in volume of the fibroid. Likewise, when we compared the RIs at different timings, the results were again in favor of misoprostol because the blood flow of myomas was substantially reduced. The RI increased from t_{0-20} (mean difference = 0.26, 95% CI 0.16 cm^3 –0.38 cm^3 , $p = 0.000$) and t_{20-40} (mean difference = 0.08, 95% CI 0.33–0.04 cm^3 , $p = 0.000$). In the control group receiving four tablets of placebo, no significant difference was noted in perfusion of the fibroid.

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Conclusion: In conclusion, we suggest that all patients scheduled for myomectomy have prior CDMRS to evaluate the degree of vascularity and to assess if they have an appropriate response to misoprostol administered rectally, so that there is minimal or no blood loss during surgery. This preoperative assessment will decrease physician apprehension, with less intraoperative blood loss and morbidity.

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Introduction

Uterine myomas (fibroids) are benign tumors of the uterus. Myomectomy, the surgical removal of myoma, is an important treatment option, especially for women who wish to preserve their uteri. The major problem with myomectomy is excessive bleeding, which can be life threatening and prolong hospital stay. Many interventions have been used to reduce bleeding during myomectomy. The effective ones include the use of tourniquets, vasopressin, chemical dissection, misoprostol, bupivacaine plus epinephrine, and tranexamic acid [1].

Mifepristone (the abortion pill) also has been shown to shrink uterine fibroids and improve quality of life [2].

Misoprostol, which is a prostaglandin analogue, is now being widely used in the prevention and treatment of postpartum hemorrhage as well as to induce birth or abortion [3]. By contracting the myometrial muscles, misoprostol has been shown to reduce the uterine artery blood flow [4]. This has been shown in Fig. 1 (A and B).

In vitro studies have shown that prostaglandins have a vasoconstrictive effect [5].

Previous studies have shown that uterine artery blood flow to the myometrium is increased in patients with myoma [6].

Uterine artery occlusion techniques developed as an alternative to the hysterectomy or myomectomy, and are successfully used in most myoma uteri cases [7,8]. Although a temporary effect, misoprostol can reduce blood flow in the myoma, and therefore can be used as an alternative to uterine artery occlusion or other invasive techniques to reduce blood flow during myomectomy [9].

The purpose of our Color Doppler Misoprostol Response Study (CDMRS) was to observe changes in vascularity and

perfusion of fibroids and the surrounding myometrium following misoprostol per rectal administration (Fig. 2).

Materials and methods

To undertake this study, the ethical approval was taken from the Ethical Review Board of the Ultrasound Society of Pakistan (Fig. 3).

The study was conducted at the Clinic/Institute of Ultrasound Imaging, Karachi, Pakistan from March 2009 to November 2011. Our center is affiliated with Thomas Jefferson University Hospital, Philadelphia, PA, USA, and provides services to almost 25,000 patients per year. Ultrasound of almost every part of the body is done at our center with the facilitation of convex, linear, transvaginal, and three-dimensional probes. The procedures are being carried out by ultrasonographer specialists and the machine used for this work was Toshiba Xario SSA-660A with a 3.5 MHz standard convex probe.

All premenopausal women (age 20–40 years) having fibroids not less than 5 cm in diameter were included in the study. The patients were evaluated during the follicular phase of the menstrual cycle Day 8 to decrease the chances of ambiguity regarding endometrial thickness and general vascularity. Written informed consent was obtained from those who wished to participate in the study. Patients who had a body mass index greater than 30, a known allergy to misoprostol, hypertension, cardiac or pulmonary disease, or fibroids smaller than 5 cm in diameter were excluded from the study. We recruited 100 patients during the study period, which fulfilled the inclusion criteria, and who agreed to participate in the study.

This was a double-blind randomized trial. Every patient filled in baseline information prior to the procedure and

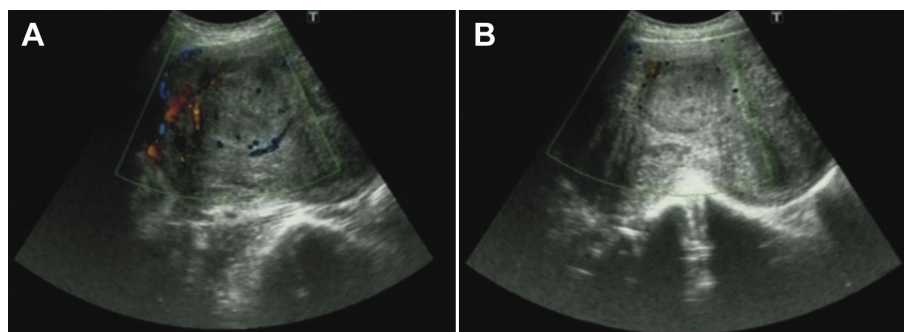


Fig. 1 Comparison of the change of blood flow in the myoma on Color Doppler Misoprostol Response Study (A) before and (B) after misoprostol administration.

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