

## THE USE OF TRANEXAMIC ACID, CARBETOCIN AND MISOPROSTOL FOR THE REDUCTION OF BLOOD LOSS DURING ABDOMINAL MYOMECTOMY IN A JEHOVAH'S WITNESS: A CASE REPORT

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### ABSTRACT

**Background:** There are myriads of measures employed by surgeons and anaesthetists in the reduction of blood loss during abdominal myomectomy, examples of which are performing the surgery during the proliferative phase of the woman's menstrual cycle, optimizing her packed cell volume, haemodilution or preloading prior to the surgery, use of tourniquet applied at the internal os just to mention a few. In addition, in challenging situations such as in Jehovah's witnesses who do not accept blood transfusion the use of tranexamic acid, carbetocin and prostaglandin-E1 (misoprostol) employed for the reduction of blood loss during myomectomy.

**Aim:** To report a case of abdominal myomectomy and create awareness on the use of intraoperative intravenous tranexamic acid, intravenous carbetocin and rectal misoprostol in blood reduction during the surgery.

**Case Report:** She was a 30 year old P0+3 with tertiary level of education, single, and of the Jehovah's Witness faith. Her Last menstrual period was on 1<sup>st</sup> may 2019. She presented with a 1-year history of progressive abdominal swelling to the gynaecological clinic. On examination she was not pale, revealed a healthy looking young woman Her abdomen was distended, with abdomino-pelvic mass compatible with to a 22 weeks size gravid uterus, the mass was firm, nodula in consistency Vaginal examination revealed 20 weeks uterine size, An impression of a huge uterine fibroid was made. She was counselled also signed the power of attorney for health care prohibiting blood transfusion. Pelvic ultrasound scan done showed solitary intramural myoma measuring 11cm by 10 cm. Pre-operative Haemoglobin concentration was 11.8g/dl other investigations were normal. She had 2 units of compatible blood grouped and cross matched for her.

Abdominal myomectomy was done under regional anaesthesia, 2g of IV Tranexamic acid 100ug of IV Carbetocin were administered intra-operatively as well as rectal misoprostol 600ug with enucleation of 12cm by 10 cm intramural myoma which weighed 2.5 Kg. The estimated blood loss was 200mls. Her postoperative period was uneventful. Her post-operative haemoglobin concentration was 11.0 g/dl. Patient was discharged on the 5<sup>th</sup> post-operative day, she was in satisfactory clinical condition 2 weeks post-operatively.

**Conclusion:** The case report revealed the role of tranexamic acid, carbetocin and misoprostol in the reduction of blood loss during myomectomy. Case series and comparative studies are recommended to strengthen the evidence of this case report. This is because blood loss during abdominal myomectomy is a challenge to care givers as well as in peculiar scenarios such as Jehovah's witnesses who do not accept blood transfusion.

**Key words:** Tranexamic acid, Carbetocin, Misoprostol, Abdominal, Myomectomy

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### INTRODUCTION

The reduction of blood loss during abdominal myomectomy is of great concerns to both the surgeons and anaesthetist as this may reduce both intra-operative and post-operative morbidities and mortalities associated with these

operations [1,2]. Some of the measures employed for the reduction of blood loss for abdominal myomectomy are performing the surgery during the proliferative phase of the woman's menstrual cycle, optimizing her packed cell volume, haemodilution or preloading prior to the surgery, use of tourniquet applied at the internal os just to mention a few [3,4]. In addition, in challenging situations such in Jehovah's witnesses who do not accept blood transfusion the use of tranexamic acid, carbetocin and prostaglandin-E1 (misoprostol) employed for the reduction of blood loss during myomectomy [5].

## CASE REPORT

She was a 30 year old P<sup>0+3</sup> with tertiary level of education, single, and of the Jehovah's Witness faith. Her Last menstrual period was on 1<sup>st</sup> may 2019. She presented with a 1-year history of progressive abdominal swelling to the gynaecological clinic.

On examination she was not pale, revealed a healthy looking young woman

Her abdomen was distended, with abdomino-pelvic mass compatible with to a 22 weeks size gravid uterus, the mass was firm, nodula in consistency, not attached to underlying or overling tissue, no differential warmth with no bruit on auscultation. Vaginal examination revealed 20 weeks uterine size, adnexae were free,pouch was empty and cervical motion tenderness was negative.

An impression of a huge uterine fibroid was made. She was counselled also signed the power of attorney for health care prohibiting blood transfusion. Pelvic ultrasound scan done showed multiple in subserous, intramural and submucous uterine fibroids the largest was intramural measuring 11cm by 10 cm.

Pre-operative Haemoglobin concentration was 11.8g/dl, electrolyte/urea/creatinine and urinalysis were normal; she was seronegative to HIV I &II and HBsAg. Abdominal myomectomy was done under regional anaesthesia, 2g of IV Tranexamic acid 100ug of IV Carbetocin were administered intra-operatively as well as rectal misoprostol 600ug, estimated blood loss was 200mls. Her postoperative period was uneventful. Her post-operative haemoglobin concentration was 11.0 g/dl. Patient was discharged on the 5<sup>th</sup> post-operative day. Her review on her 2 weeks post-operative day was uneventful.

## DISCUSSION

This case report revealed the reduction of blood loss in abdominal myomectomy in a nullipara using intra-operative tranexamic acid, carbetocin and rectal misoprostol. The blood loss for the surgery was 200 mls, this is low when compared to similar surgeries with the absence of these drug interventions [2-4]. Abdominal myomectomy is a bloody surgical procedure even in the most experienced hands [1-3]. Performing myomectomy in a Jehovah's Witness is even more challenging as most of them do not accept blood transfusion by reason of their faith [2-5]. This report seeks to highlight various methods that can be apply to control blood loss intraoperatively and using a combination of these interventions; intravenous Tranexamic acid, intravenous Carbetocin and rectal Misoprostol [4-8].

Hemorrhage is one of the most important concerns with open myomectomy. Blood loss during surgery largely depends on the number and size of the fibroids harvested and the technique adopted during myomectomy [1,8].

Tranexamic acid a synthetic lysine derivative with anti-fibrinolytic activity has been used since the 1960s in a variety of clinical settings [1][7-10]. It acts as an anti-fibrinolytic agent via the reversible blockade of lysine- binding sites on plasminogen molecules [11]. It has been routinely used for many years to reduce hemorrhage intraoperatively and after surgical procedures [12]. Tranexamic acid has been shown to be efficacious in reducing blood loss and the need for blood transfusions [2,6].

Carbetocin is a synthetic analogue of oxytocin with similar pharmacodynamics properties but longer acting. It is an octapeptide while oxytocin is a nonapeptide and due to its structural difference carbetocin is more stable and is more resistant to degradation by disulphidase, aminopeptidase and oxidoreductase enzymes [3].Carbetocin selectively binds to oxytocin receptors in the smooth muscle of the uterus resulting in rhythmic uterine contractions, increased frequency of existing contractions and increased uterine tone [1,4]. It has a rapid onset and long lasting action [4]. It can be administered as a single dose injection either intravenously or intramuscularly [1,7]. The intravenous route half- life of cabetocin is 40 minutes which is 10 times that of oxytocin [3-4].

Rhythmic uterine contractions continue for 60 minutes after the intravenous injection and for 120 minutes after

the intramuscular administration [9]. Side effects of carbetocin are similar to oxytocin including hypotension, flushing, headache and abdominal pain [3,10].

Misoprostol a Prostaglandin E1 analogue can be administered through various routes: oral, sublingual, buccal, vaginal or rectal [2-4]. It is a second line drug for treatment of postpartum hemorrhage.its side effects include pyrexia, shivering and GI disturbances [6].

Lofty M, et al 2020 compared Tranexamic acid with Carbetocin during open myomectomy and concluded that Carbetocin was more effective in reducing blood loss during abdominal myomectomy [1].

Yang and Colleagues, 2012 compared Carbetocin and oxytocin in reducing blood loss during laparoscopic myomectomy and concluded that giving Carbetocin pre-operatively to laparoscopic myomectomy patients had good clinical efficacy [5].

## CONCLUSION

A combination of intravenous Tranexamic acid , Carbetocin and rectal Misoprostole can be used to reduce intraoperative blood loss and prevent postoperative anaemia for especially in religious, cultural or social reasons. Our index patient was a Jehovah Witness that had declined blood transfusion no matter the outcome and our aim was to reduce intraoperative blood loss using a combination of intravenous tranexamic acid and carbetocin with misprostol administered rectally.

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## REFERENCES

1. Sallam HF, Shady NW. Intravenous Carbetocin to decrease blood loss during open myomectomy: a randomized placebo-controlled study. *Int J Reprod Contracept Obstet Gynecol* 2018;7:27-32.
2. Mariam Lotfy, Zakia M Ibrahim, Ahmed M Abbas, Sherehan M Alkeplawy, Khaled A Atwa. Tranexamic Acid versus Carbetocin for Reduction of Blood Loss during Abdominal Myometomy: a Randomized Clinical Trial. *W J Gynecol Women's Health*. 3(4): 2020.WJGWH.MS.ID.000570. DOI: 10.33552/WJGWH.2020.03.000570.
3. Sweeney G, Holbrook AM, Levine M, Yip M, Alfredsson K, Cappi S et al. pharmacokinetics of Carbetocin, a long acting oxytocin analogue, in non pregnant women. *Curr Ther Res Clin Exper*1990; 47:528-39.
4. Hunter DJ, Schulz P, Wassenaar W. Effect of Carbetocin, a long-acting oxytocin analog on the postpartum uterus. *Clin Pharmacol Ther*. 1992;52:60-7.
5. Nishida T, Kinoshita T, Yamakawa K(2017)Tranexamic acid and trauma induced coagulopathy. *J Intensive Care* 5:5.
6. Engstrom T, Barth T, Melin P, Vilhardt H. Oxytocin receptor binding and uterotonic activity of Carbetocin and its metabolites following enzymatic degradation. *Eur J Pharmacol*. 1998;355(2-3):203-10.
7. Kongnyuy EJ, Wiysonge CS. Interventions to reduce haemorrhage during myomectomy for fibroids. *Cochrane Database Syst Rev*.2011: Cd005355.
8. Rath W. Prevention of Postpartum hemorrhage with the oxytocin analogue carbetocin. *Eur J Obstet Gynecol Reprod Biol*.2009;147(10):15-20.
9. Drew T et al. Carbetocin at elective caesarean section: a sequential allocation trial to determine the minimum effective dose in obese women. *Anaesthesia* 2020; 75(3): 331-337.
10. Elgarhy EM, Mohamed AH, Abdelfatah MM. Carbetocin versus Oxytocin in Prevention of Post-Partum Haemorrhage. *AIMJ* 2020; 3(1): 265-269.
11. Opoku-Anane J, Varjas M, Marfori CQ, Moawad G, Maasen MS, Robinson JK. Intra-operative tranexamic acid to decrease blood loss during myomectomy: a randomized double-blind placebo controlled trial. *Am J Obstet. Gynecol*. 2020; 223(3): 413e1 – 413e7.
12. Wali S, Balfuossia D, Touqmatchi D, Quinn S. Misoprostol for open myomectomy: a systematic review and

meta-analysis of randomized control trials. BJOG 2020; 128(3): 476 – 483.