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Pain control for uterine fibroid embolisation : An initial experience in East Africa.

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PAIN CONTROL FOR UTERINE FIBROID EMBOLISATION-AN INITIAL EXPERIENCE IN EAST AFRICA

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SUMMARY

Uterine fibroid embolisation (UFE) generates moderate to severe post-procedural pain. We present a case series of 24 patients who underwent UFE during our first experience in managing the sometimes excruciating pain that accompanies embolisation of the uterine arteries. We also show the evolution of our protocol for post-procedural pain management from a first to second round of procedures.

INTRODUCTION

Uterine fibroid embolisation is a well established effective method for treating symptomatic uterine fibroids (1-4) but is new in African clinical practice. It is suggested that UFE causes degeneration and shrinkage of fibroids, controlling or substantially improving menorrhagia, pelvic pain and pressure in more than 80% of patients. The magnetic resonance imaging (MRI) and pathologic findings reported suggest that the fibroids undergo infarction and subsequent hyaline degeneration (5-7). The infarction of the fibroids occurs in the first hours after embolisation (8), causing severe ischaemic pain in many patients. This makes timely and adequate pain management a key point in the success of UFE. In some centres, pain management for UFE is supervised by the interventional radiologist while in others this is managed by anaesthesiologists.

We report our experience from the first series of UFE procedures in East Africa undertaken at the Aga Khan University Hospital, Nairobi. A visiting interventional radiologist, who runs a busy UFE service in the United Kingdom and Trinidad and Tobago, requested a standby anaesthesiologist in case a need arose for pain control.

He had observed that in Trinidad and Tobago where anaesthesiologists took care of the post-procedural pain management, pain control was better than in the centres where he performed the UFE and simultaneously supervised the sedation and pain management for the patients.

Two UFE workshops, both conducted over a three day period, in December 2009 and April 2010. A protocol for sedation and pain control developed by the interventional radiologist was recommended in the first workshop. It had to be modified after three UFE procedures as a result of patient response, observation and feedback to the medications administered. The modifications were done with an endpoint of achieving optimised post-procedure pain control.

For the second workshop we applied the protocol that had been used on the last day of the first workshop. We report this series of UFE procedures to document our experience and provide new insights on ways of managing the sometimes excruciating pain that follows embolisation.

CASE SERIES PRESENTATION

During these two workshops we cared for 24 patients undergoing UFE, 12 in each. The first round was the most challenging since it was our initial experience in UFE management at the Aga Khan University Hospital. All patients were admitted on the day of the procedure and reviewed the same day. Characteristics of the women who underwent the procedure are shown in Table 1.

Table 1
Baseline variables of women undergoing UFE

Age (years)	2009 (n=12)	%	2010 (n=12)	%
18-30	1	8.3	1	8.3
31-35	1	8.3	0	0
36-45	7	58.3	10	83.3
Above 45	3	25	1	8.3
Parity				
Nulliparous	9	75	8	66.6
1	2	16.6	3	25
2	1	8.3	0	0
3	0	0	1	8.3

CASE ONE

On the first day, the protocol for pain management used had been recommended by the interventional radiologist. Three patients underwent UFE and received midazolam 4mg and Augmentin 1.2gm intravenously (iv) prior to local anaesthesia being infiltrated over the femoral region. They were then given diclofenac suppository 100mg, intravenous paracetamol 1gm before and at the start of the procedure. Morphine 5mgs was then injected intravenously before each artery was embolised followed by intravenous Buscopan 10mg. Thereafter, pain control medication was administered as per the protocol shown in table 2. The three patients undergoing UFE on day one had moderate to severe post procedural pain. This observation made us modify our pain management protocol to the one shown in Table 2.

Table 2
Initial algorithm for pain control during UFE

Patient admission	IV access
	IV midazolam 4 mg
Angiography suite	Pulse oximeter monitoring
	Morphine 5 mg before embolization of each uterine artery.
	Diclofenac suppository 100mg
	IV paracetamol 1 gm
	IV buscopan 10 mg 8 hourly
Recovery room	PCA* morphine 1mg/ml
	+/- morphine bolus 2-4 mg
	Nausea- IV ondansetron 4mg
	Discharge to ward after pain stabilisation.
Re-admission to ward	Morphine PCA
	Oral Diclofenac/paracetamol to continue.
	IV ondansetron 4mg PRN#
	IV Metoclopramide 10 mg PRN
Next morning	Removal of IV drip, PCA
	Continue oral diclofenac
	Betapyn 2 tablets 8 hourly
Patient discharge	Diclofenac 50 mg 6 hourly

*PCA-patient controlled analgesia
#PRN- As required

Table 3
Revised algorithm for pain control during UFE

Patient admission	IV access
Recovery room	PCA instructions and connection
	Pulse oximeter monitoring
	Morphine 2 mg bolus, then 2mg/5-7 minutes
	IV paracetamol 1 gm
	IV buscopan 10 mg 8 hourly
Angiography suite	Pulse oximeter monitoring
	Morphine infusion 2-4 mg/hour
	IM Diclofenac 75 mg
	IV paracetamol 1 gm
Recovery room	Morphine PCA and infusion to continue
	Nausea- IV ondansetron 4mg
	Discharge to ward after pain stabilisation
Re-admission to ward	Morphine PCA and infusion overnight
	Oral Diclofenac/paracetamol to continue
	IV ondansetron 4mg PRN#
	IV Metoclopramide 10 mg PRN
Next morning	Removal of IV drip, PCA
	Continue oral diclofenac
	Betapyn 2 tablets 8 hourly
Patient discharge	Diclofenac 50 mg 6 hourly
	Betapyn 2 tablets 8 hourly

Betapyn TM is a mixture of codeine 10 mg and paracetamol 300mg

Day two began with a post-procedural follow up and review of patients who had undergone UFE the previous day. Thereafter, the protocol was adjusted during the pre- and peri-procedural period as follows:

- Intravenous access, intravenous paracetamol being infused before preparation and draping plus 2mg of midazolam
- Nasal prongs and oxygen flow at 3Litres/minute
- Morphine given as the previous day.
- Intramuscular (im) diclofenac used (instead of suppository)
- Commenced iv morphine infusion at 2-4mg/hour on completion of procedure.

On day three, we continued with post-procedural follow up and review of patients. Only one patient who had had the procedure on the first day was still an inpatient owing to moderate pain of 4/10 on the Visual Analogue Scale (VAS). We completely changed the protocol to the one depicted in Table 3.

This group had better pain control than the previous days. On day four, we continued with the post-procedural follow up of day three patients. All patients were discharged. Thus at the end of the first workshop, three out of twelve patients were discharged with pain score of 0/10 and the rest were discharged with mild pain (VAS score 1-3).

CASE TWO

This workshop was held in April 2010, we used the protocol in table 3 for the pain management of all patients. This time the anaesthesiologist was involved in the pre-procedural assessment of the patients as there was ample time for preparation and scheduling of the patients. All patients were seen before the procedure and instructed on the use of PCA.

On the first day, four patients underwent UFE. One patient had itching as a side effect and another had nausea and vomiting. All four patients had no pain to mild pain and were discharged the next day.

On the second day we began with review of the post-procedural patients of day one. The patient who had vomited the previous day had recovered. We continued to use the same protocol with no problems. After UFE, one of the five patients developed urinary

retention that was treated with bladder catheterisation for 24 hours. She was agitated and complaining of severe pain but once the morphine had been reduced she reported not remembering the severe pain. However she had mild pain at that time. She spent three days in hospital. The final three patients reported no pain to mild pain as complaints. They were discharged the day following the procedure with no other complaints.

This service evaluation and improvement study was approved by the Aga Khan University, East Africa, Research and Ethics committee.

DISCUSSION

Uterine fibroid embolisation is an effective treatment for uterine fibroids (9). However, this procedure is associated with a high incidence of moderate to severe pain and post-operative nausea and vomiting (PONV) (10). UFE is a procedure which is normally performed in radiology suites without an anaesthesiologist getting involved in the patient's management (11).On this basis we were asked to be on standby owing to the fact the patients would be sedated using the interventional radiologists' protocol. Due to the immediate intense pain generated by the infarcting fibroids we progressively (5-7,10) altered the protocol suggested by the interventional radiologist during the first project to that shown in Table 3.

The protocol in Table 3 provides the anaesthesiologist a much better opportunity to get involved in pain management as early as possible and gives a sequential approach to the entire management of the whole UFE procedure. With the model described in Table 1, where the need for evolution to the model shown in Table 2 arose, it will be noted that the first encounter between the anaesthesiologist and the patient was in the recovery room with this development, (Table 2) patients were seen by the anaesthesiologist the day before or at admission on the day of the procedure. In other institutions the patients are also referred to an Acute Pain Service for evaluation by an anaesthesiologist and instructed on the use of patient-controlled analgesia (12).

This early referral to an Acute Pain Service and involvement of the anaesthesiologist greatly improves outcome through increased knowledge among patients of the use of the PCA and post-procedural pain control. Morphine in PCA has been used by many investigators for management of post-UFE pain (2,13,14). During the first round of procedures we noted that a concentration of morphine 1mg/ml in a PCA device was not an adequate dose for the patients who kept using it a lot.Half the volume with a concentration of 2mg/ml was therefore used during the second round of treatments. Patients used the PCA less during this round probably due to the fact that we had given a significant amount during the procedure and they were transferred to the ward with an infusion of morphine running. We encountered more problems with morphine during the second round of treatments mainly nausea/vomiting and urine retention. We suspect that these adverse effects could be avoided with the use of epidural analgesia using local anaesthetic and low dose opioid (14). However this might prolong hospital admission by an extra day and would necessitate the development of another protocol using epidural analgesia with boluses or infusion of local anaesthetics with or without opioid additives. Costs of the procedure are an important constraint in this setting and an appropriate strategy is to minimize the cost of agents and devices used while facilitating the rapid recovery to keep the inpatient stay as short as possible. We discharged our patients with the analgesics shown in table 3 and none required additional pain control in hospital except for the first patient in the first project who had moderate to severe pain.

This intractable pain was later noted to have been due to a persisting intrauterine (submucosal) fibroid that required hysteroscopic resection.Patients were given direct telephone access to the anaesthesiologist following discharge, which enabled rapid provision of advice and reassurance. This access was greatly appreciated by the patients.

In conclusions, pain is and will always be a common side effect of UFE. There is currently no consensus regarding the best method for managing pain in UFE patients (15). This being a new experience of managing UFE patients in Kenya and probably in the East African region it would be prudent to further investigate and produce other protocols including one involving epidural analgesia. This will be feasible when the participating departments of gynaecology, anaesthesiology and radiology work closely together so that patients can be educated in use of the PCA and other modalities of analgesia as well as optimizing them for the procedure.

Pre-procedural block of the superior hypogastric nerve via the anterior transabdominal approach has been advocated by some and has allowed UFE to be performed as a day case procedure (16). It is also thought that with adequate analgesia, the procedure maybe performed without sedation (17).

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