Volume 1 • Issue 2 • 2018

Editorial

Gynaecology and Perinatology

Heavy Menstural Bleeding: *Then* and *Now*

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Received: January 03, 2018; **Published:** January 11, 2018

Abstract

Heavy menstrual bleeding is defined as "regularly excessive menstrual blood loss that affects the physical, social, emotional or material quality of life of the patient". As the accurate assessment of menstrual blood volume is difficult as well as being highly subjective, the traditional definition of menorrhagia as > 80 mL menstrual blood loss per cycle is not a meaningful one.

Causes of menorrhagia include myometrial abnormalities including uterine fibroids and adenomyosis, and endometrial pathologies including polyps, endometritis, hyperplasia and carcinoma. Rarely, advanced cervical cancer presents with heavy and erratic vaginal bleeding. Bleeding disorders and anticoagulant use may be causative or contributory. The investigations and management of HMB is dependent on patient age and likely cause. Following initial investigations, one should take into consideration the patient's current contraception needs and plans for future pregnancy.

Keywords: *Heavy menstrual bleeding; Menorrhagia; Menstrual blood loss*

Volume 1 Issue 2 January 2018

Introduction

Heavy menstrual bleeding (HMB), previously menorrhagia, is a benign yet debilitating social and health condition. It is clinically defined as blood loss > 80 mL per menstrual cycle. In general clinical practice, diagnosing menorrhagia is subjective and it is the woman's perception of menstrual blood loss (MBL) and how it is interfering with her physical, social, and emotional quality of life that is the key determinant in her presentation, referral and subsequent treatment [1].

Heavy menstrual bleeding (HMB) is common, affecting a quarter of the female population [2], with an estimated prevalence of 53 per 1000 women [3]. Menstrual problems account for around one in five gynecological outpatient referrals [4]. HMB could be treated with both medical and surgical interventions and both methods are safe, acceptable and effective.

"Palm-coein" Classification - to Determine etiology or Association

The Federation Internationale de Gynecologie et d'Obstetrique (FIGO) has designed the PALM-COEIN classification system to define causes of AUB5. The components of PALM group include structural causes: Polyp (P), Adenomyosis (A), Leiomyoma (L), Malignancy (M) and COEIN group includes nonstructural causes: Coagulopathy (C), Ovulatory Disorders (O), Endometrial Disorders (E), Iatrogenic Causes (I), and Not Classified (N). The classification also defined intermenstrual bleeding (IMB) as it occurs between clearly defined cyclic and predictable menses while AUB was referred to as bleeding that is abnormal in volume, regularity and/or timing.

Investigations

Laboratory Tests

All patients presenting with HMB should have a full blood count taken to exclude significant anaemia, classified as hemoglobin of less than 10 g/dL. The platelet level should be assessed, as conditions such as ITP causing thrombocytopenia are a known, although rare, causes of HMB. For patients in whom heavy menstrual bleeding has been present since menarche and/or the family history is suggestive of a bleeding disorder, a coagulation profile should be performed. Investigations for specific bleeding disorders are indicated only if the coagulation profile is abnormal.

The likelihood of finding a coagulopathy such as Von Willebrands Disease is greatest in patients with severe anaemia (< 10 g/dL) and low ferritin levels [6-7]. Hormone profile testing, including follicle stimulating hormone (FSH), luteinizing hormone (LH) progesterone level at any stage of the cycle should not be carried out as part of the routine investigation of the patient with HMB, as they are unhelpful in determining causation. Thyroid function testing should be performed only where history or clinical examination are suggestive of thyroid disease.

Ultrasound

Ultrasound evaluation is indicated in the event of abnormal findings and is the imaging modality of first choice. Imaging of the pelvis should be performed if the uterus is palpable abdominally, if bimanual examination reveals a pelvic mass and/or if initial pharmacological management fails. The finding of intramural uterine fibroids less than 3 cm diameter does not constitute a significant ultrasound abnormality, unless multiple fibroids are present. The finding of sub mucosal fibroids on ultrasound indicates that Mirena insertion is not likely to be an effective management strategy, with a high risk of expulsion; however, other hormonal and non-hormonal treatments are appropriate.

Although often difficult from a practical perspective, endometrial thickness is ideally measured in the follicular phase, when a finding of an endometrial thickness over 10mm is suggestive of pathology. It is also useful to time ultrasound assessment if further scans are planned for comparative purposes. The finding of an endometrial thickness endometrium greater than 15 mm is associated with a higher chance of endometrial pathology, as is the finding of inhomogeneous echoes and vascular flow within the endometrium [8]. These findings should prompt further evaluation.

Endometrial Biopsy

An endometrial biopsy should be performed in all women aged 45 years or older with new-onset or worsening HMB to exclude endometrial carcinoma or hyperplasia. Endometrial biopsy should be performed in women under 45 years who have menorrhagia associated with obesity or PCOS (chronically increased estrogen exposure) in whom the risk of endometrial cancer is increased. Endometrial biopsy is also indicated in the context of failed medical management and in women at high risk of endometrial cancer (e.g family history, tamoxifen use, Lynch syndrome). Various endometrial sampling devices (Endosampler, Endocurette, Pipelle) are currently used in gynaecological practice.

Hysteroscopy

Hysteroscopy is appropriate when there is regular unscheduled vaginal bleeding (intermenstrual or post-coital bleeding), when ultrasound suggests an endometrial polyp, or when endometrial carcinoma is suspected on ultrasound assessment. It is not a mandatory investigation in all women presenting with HMB, as the likelihood of endometrial pathology is very low in younger women. Patient age, symptom severity, associated symptoms and clinical risk factors should drive the intensity of investigation.

Increasingly, the traditional investigation of hysteroscopy with dilation and curettage (D&C) is being replaced by ambulatory (outpatient) hysteroscopy with endometrial biopsy. The "one-stop shop" pathway, combining diagnostic procedures of ultrasound, hysteroscopy and endometrial biopsy together with LNG-IUS insertion and the latter option of outpatient endometrial ablation should become the standard of care for the investigation and management of abnormal uterine bleeding in all gynecology units in the coming decade.

Management of Hmb: *Then* and *Now*

Medical therapies

NSAIDs

NSAIDs are a first-line medical therapy in ovulatory menorrhagia. Recent evidence reviewed by the National Institute for Health and Clinical Excellence showed that the use of NSAIDs in the management of menorrhagia was associated with a 20% to 40% significant reduction in blood loss. Mefenamic acid was associated with a 29% reduction in menstrual flow, whereas naproxen and ibuprofen were also associated with a 26% and 16% reduction, respectively, although they are not licensed for menorrhagia [9].

Tranexamic Acid

Tranexamic acid, a plasminogen activator inhibitor, controls menorrhagia by inhibiting the dissolution of thrombosis. Lethaby and colleagues [10] reported that the use of antifibrinolytic therapy was associated with a greater reduction in HMB when compared with placebo or other medical therapies such as NSAIDS, oral luteal phase progestogens, and ethemsylate. The review undertook a meta-analysis of two randomized clinical trials of Tranexamic acid versus placebo and found a difference of 93.96 mL (95% CI, 151.43 mL to 36.49 mL; P = 0.001), in favor of treatment [10].

Two further reviews have assessed the efficacy of tranexamic acid on HMB. The second review consolidated the results of seven trials and found a reduction in MBL of 46.7% (95% CI, 47.9%–51.6%) with tranexamic acid [11]. The last review reviewed five trials and concluded that oral tranexamic acid, 2.0 to 4.5 g daily, for 4 to 7 days per cycle reduced MBL by 34% to 59% over two to three cycles [12].

Combined Oral Contraceptive Pill

Combined oral contraceptives (COCs) are believed to work by regulating the cycle and thinning the endometrium, which eventually leads to a lighter withdrawal bleed. The majority of COCs are monophasic; that is, they are dosed at the same strength throughout the 21-day treatment phase. COCs are generally used in 21-day treatment cycles followed by a 7-day break, during which time endometrial breakdown and loss occurs. Such withdrawal bleeding is physiologically different from the bleeding that occurs after a natural ovulatory cycle.

In a Cochrane review assessing the effectiveness of the oral contraceptive pill in the management of menorrhagia, one randomized control trial focused on comparing COCs with naproxen, Mefenamic acid, and diazole. The menstrual blood flow was measured in two to four control cycles and during therapy. Measured blood loss was reduced by 20%, 38%, and 39% in the naproxen (NSAID), Mefenamic acid (NSAID), and danazol (synthetic steriod) groups, respectively. Naproxen reduced blood loss by 12%, the oral contraceptive reduced blood loss by 43%, and danazol reduced blood loss by 49% [13-14].

Oral Progesterone

Progesterone is a physiologic hormone responsible for secretory transformation of the endometrium, and bleeding occurs when endogenous levels of estrogen and progesterone fall if fertilization does not occur. The mechanisms by which oral progestogens reduce

MBL are not fully understood [15]. The first review, published in 1995 and comprising four randomized clinical trials, showed that norethisterone had no effect on MBL (MBL percentage change: 95% confidence interval [CI], 6.1% to +1.1%) [11].

The second review, undertaken in 2003, consisted of seven randomized clinical trials. It showed that norethisterone was not as effective as the nonsteroidal anti-inflammatory drugs (NSAIDs), which were associated with an MBL of 23.0 mL in favor of the NSAIDs. When compared with danazol, the latter was more effective in producing a reduction in MBL of 55.6 mL. A comparison with tranexamic acid revealed that norethisterone was not superior, as it failed to produce the 111.0 mL reduction in MBL associated with tranexamic acid. Oral progesterone versus a progesterone intrauterine system (IUS) showed a change in MBL of 51.0 mL in favor of the IUS [16].

Another randomized clinical trial examined the use of oral progestogens cyclically for 21 days versus the use of a levonorgestrel-releasing IUS (LNG-IUS). It concluded that an 83% reduction in MBL was associated with long-term use of oral progestogens, compared with a 94% reduction with the LNG-IUS [17].

Levonorgestrel-releasing Intrauterine System

The LNG-IUS is an intrauterine, long-term progestogen-only method of contraception licensed for 5 years of use. The device consists of a T-shaped plastic frame with a rate-limiting membrane on the vertical stem containing 20 μg of levonorgestrel. The levonorgestrel is released in a controlled dose over 24 hours for up to 5 years. The effects of the LNG-IUS are mostly local and hormonal; it prevents endometrial proliferation and causes thickening of cervical mucus. Two recent systemic reviews demonstrated a 71% to 96% reduction in menstrual blood flow and amenorrhea in 20% to 30% of women when the LNG-IUS was used [18-19].

The first review, published in 2005, identified 10 RCTs comparing LNG-IUS with surgery or medical treatments. When comparing LNG-IUS against any pharmaceutical treatment (1 RCT, n = 35), the odds ratio (OR) for amenorrhea (> 3 mo) was calculated as 8.67 (95% CI, 1.52–49.35) in favor of LNG-IUS and the OR for the proportion of women who were satisfied with treatment (1 RCT, n = 40) was 2.13 (95% CI, 0.62–7.33) [18]. In the second review, five RCTs and five case series were analyzed. The MBL reductions reported in the RCTs were between 71% and 96% [19].

Pharmaceutical Therapy Failure

In the event that medical therapies prove to be ineffective, the patient should be transferred to secondary care for further management.

Surgical Management

The choice between surgical options and medical therapies for the management of HMB is dependent on the age of the woman, the extent to which the HMB is affecting her life, and her contraceptive needs. In the majority of cases, surgical options are only really explored once medical therapies fail. A recent systematic review assessed the long-term benefits of medical versus surgical therapies and showed that, in secondary care facilities, surgical management of HMB has a slight advantage over medical treatment, which diminishes over time (control of bleeding at 5 years [n = 140] OR, 1.99 [95% CI, 0.84–4.73]) in favor of surgery.

In one randomized clinical trial included in the review, women who underwent immediate surgery had statistically higher quality of life at 5 years than those who underwent surgery after failed pharmaceutical treatment [20]. Although surgery has an advantage over pharmaceutical treatment with regard to outcome, the reversible nature of pharmaceutical treatment compared with surgery must be taken into account.

Endometrial Ablation

In the 1990s, if medical therapies failed to control HMB, hysterectomy was the only definitive surgical option available. Since then, a number of surgical options have been developed. Endometrial ablation destroys and removes the endometrium along with the superficial myometrium. First-generation endometrial ablation involved distending the uterine cavity with fluid and resecting the tissue with an electrosurgical loop.

Second-generation methods use thermal balloon endometrial ablation (TBEA), microwave endometrial ablation (MEA), hydrothermablation, bipolar radiofrequency (RF) endometrial ablation, and endometrial cryotherapy. In comparison with first-generation methods, the second-generation methods do not need to be carried out under direct uterine visualization and tend to be easier to learn. A 2004 systematic review consisting of 2 reviews and 10 RCTs examined the safety and effectiveness of MEA and TBEA for HMB; the rate of amenorrhea 1 year after treatment ranged between 36% and 40% for MEA and between 10% and 40% for TBEA [21].

Uterine Artery Embolization

In women in whom fibroids are the cause of the HMB, two further surgical options are available: uterine artery embolization (UAE) and myomectomy. UAE is usually performed by an interventional radiologist on a sedated patient. It involves injecting small polyvinyl particles into the uterine arteries through a catheter that is inserted via the femoral artery; this causes the eventual blockage of the feeding capillaries associated with the myoma. The eventual loss of the blood supply to the fibroids causes them to shrink, thereby allowing us to treat the cause of the HMB.

Myomectomy, on the other hand, involves the surgical removal of fibroids and can be done by laparotomy, laparoscopy, or hysteroscopically. UAE is often preferred over myomectomy as it is a quicker procedure and is associated with a shorter hospital stay. A recent systematic review, however, favored myomectomy to UAE as the rates of re-intervention were fewer when compared with UAE [22]. A further cohort study analyzed the outcomes associated with myomectomy versus UAE; at 14 months, a greater reduction in menorrhagia was seen in the UAE group (92%) compared with the myomectomy group (64%) [23].

Hysterectomy

Although the most radical form of management of HMB, hysterectomy does provide a definitive cure for menorrhagia. It involves the surgical removal of the uterus. Until approximately the 1990s, hysterectomy was considered as the only viable surgical treatment for HMB. Because of the morbidities associated with a hysterectomy, the permanent repercussions of the surgery, and its cost to the National Health Service, there is a strong incentive to reduce the number of hysterectomies performed and to encourage conservative modes of treatment such as the LNG-IUS, endometrial ablation, and UAE as management options for HMB. Since the development of new pharmaceutical and less invasive surgical options, the number of hysterectomies in the United Kingdom has decreased (from 24,355 in 1993 down to 10,559 in 2002) [1]. Concurrently, advances in endoscopic technologies such as diathermy, laser, and ultrasonic energy have enabled most hysterectomies to be performed with minimally invasive techniques. More conservative, effective, and medical interventions are currently being developed and should provide additional alternatives to hysterectomy.

Modalities under consideration

Gonadotropin-releasing Hormone Antagonists

Uterine fibroids are often the cause of HMB in women, and their growth is often dependent on ovarian steroids. Therefore, it was hypothesized that a pharmacologically induced hypoestrogenic state, similar to menopause, should decrease their growth and consequently the associated HMB. Gonadotropin-releasing hormone (GnRH) antagonists have been shown to be effective in creating this pseudomenopausal environment by competing with endogenous GnRH for binding sites in the pituitary gland, causing a reduction in gonadotropin release.

In comparison with GnRH agonists (leuprorelin), antagonists suppress pituitary gonadotropins immediately and because GnRH antagonist activity is dose dependent, it can be adjusted to obtain the desired therapeutic outcome. Discontinuation of GnRH antagonist treatment leads to a rapid and predictable recovery of the pituitary-gonadal axis.

Selective Estrogen Receptor Modulators

Among the selective estrogen receptor modulators (Clomifene, Tamoxifen, Toremifene, Raloxifene, Ospemifene and Bazedoxifen), Ormeloxifene, a nonsteroidal selective estrogen receptor modulator (SERM), is currently undergoing clinical evaluation for the

treatment of HMB. Its beneficial role in the treatment of menorrhagia was observed when it regulated dysfunctional uterine bleeding and improved endometriosis symptoms in women using it as a form of contraception [24].

Because of its antiestrogenic effects as well as its antiprogestational capacity, it is also being evaluated for its use in the treatment of advanced breast cancer and the prevention of osteoporosis. A study by Kriplani and colleagues assessed its efficacy and safety in the medical management of menorrhagia and it was found that the median duration of bleeding reduced from a pretreatment length of 7 days (range 4–30) to 3 days (range 0–6) after 4 months of treatment ($P < .001$) [25].

Progesterone Receptor Antagonist

Progesterone antagonists such as mifepristone are commonly used for the evacuation of the pregnant uterus and for the induction of labor. It has also been extensively used in research settings as a possible treatment for fibroids. A systematic review by Samuel and Clark [26] analyzed six studies that used mifepristone as a treatment option for women with HMB associated with uterine fibroids; uterine blood loss ranged from 27% to 49%.

A Cochrane review about the use of mifepristone in the management of symptomatic uterine fibroids concluded that even though mifepristone had no effect on the size of the fibroids, a definite reduction in menstrual flow secondary to the fibroids was noted when compared with placebo (OR, 17.84; 95% CI, 6.72–47.38; 2 RCTs, 77 women; I2 50%) [27].

Selective Progesterone Receptor Modulators

Selective progesterone receptor modulators have been reported to induce an antiproliferative effect on the endometrium, although the exact mechanism of action is not clear. Trials assessing the effectiveness of asoprisnil in the management of HMB showed reduction in menstrual flow proportionate to the dose prescribed [26].

Aromatase Inhibitors

Aromatase inhibitors markedly reduce plasma estrogen levels in postmenopausal women by inhibiting the aromatase enzyme, which catalyzes the synthesis of estrogens from androgenic substances such as androstenedione. Fibroids express aromatase, and the use of aromatase inhibitors in the management of HMB due to fibroids is only confined to some case reports in which they were shown to cause a dramatic reduction in fibroid size, as well as thinning of the endometrium, leading to much lighter menstrual bleeding. A 71% reduction in fibroid size over an 8-week period has been reported by Japanese investigators [28].

Surgical Treatment

Laparoscopic Bilateral Uterine Artery Occlusion

A 2001 study evaluating the effectiveness of laparoscopic bilateral uterine artery occlusion (LUVO) compared with UAE concluded that it was as effective as UEA, with 88.4% of patients reporting definitive symptomatic improvement and 21.2% reporting complete resolution of their symptoms [25]. LUVO essentially involves occlusion of the uterine arteries, at the level of the internal iliac artery, with an endoclip, and coagulation of the collateral arteries between the ovaries and uterus.

Current studies are now looking at expanding the use of LUVO by analyzing its effectiveness when combined with procedures such as simultaneous myomectomy, either through laparoscopy or through a mini laparotomy. Early results from these trials report this combination to produce maximum symptom relief (98.1%–100% symptom resolution) in women with symptomatic uterine myomas, in addition to minimized tumor recurrence and a reduction in the number of reinterventions [26].

Transvaginal Doppler-guided Vascular Clamp

Even though UAE and LUVO are known to provide symptomatic relief to patients with fibroids, they do have limitations. UAE needs to be performed by an interventional radiologist, whereas LUVO is limited by the laparoscopic expertise of the surgeon and is associated with laparoscopic complications. Consequently, alternative techniques such as the transvaginal Doppler-guided vascular clamp are being

explored. The Flostat™ system (Vascular Control Systems, San Juan Capistrano, CA), is presently being used in the United States; it consists of (1) a guiding cervical tenaculum, (2) a transvaginal vascular clamp with integrated Doppler ultrasound crystals, (3) a coupler that advances the clamp over the tenaculum, and (4) a battery-powered ultrasound transceiver that generates an audible Doppler signal [29].

Earlier reports of the effectiveness of the transvaginal Doppler-guided vascular clamp include reports by Vilos and colleagues [29] and Lichtinger and colleagues [30] in which they applied a transvaginal Doppler-guided clamp over the lateral aspect of the cervix in 10 women and laparoscopically observed bilateral occlusion of the uterine arteries. A recent study assessed the effectiveness of Doppler-guided vascular clamps to treat menorrhagia. In all 30 patients, after pelvic examination, a weighted speculum was placed in the vagina, and a tenaculum was placed on the anterior lip of the cervix [31].

The bladder was drained and an ultrasound of the uterus was performed. The cervix was reportedly dilated to 6 mm, and any intrauterine pathology was ruled out through a hysteroscopy. The cervix was further dilated to 10 mm, and sharp uterine curettage was performed to initiate the clotting cascade. The tenaculum was then removed, and a uterine stabilizer was placed on the posterior lip of the cervix. The Doppler-guided clamp was then attached to a stabilizer and advanced to the sides of the cervix using the coupler. The Doppler ultrasound sensors on the clamp were attached to the Doppler transceiver, and the sound of flow through the uterine arteries was detected through intact vaginal mucosa [31].

The clamp was advanced until the ultrasound audio changed to a "whipping" sound, thereby indicating bending of the uterine arteries over the tip of the clamp. The clamp was closed, and Doppler was used to confirm occlusion of the uterine arteries, indicated by loss of audible Doppler signal. All patients in the study were then placed in the supine position and transferred to the recovery room, where they remained supine and immobile with the clamp in place. Follow-up in the study reported a 24% average decrease in the fibroid size as well as an average reduction of 12% in uterine mass and a mean reduction of 42% in menorrhagia-associated symptoms by 6 months [31-32].

In addition to being a more cost-effective alternative, the transvaginal Doppler-guided vascular clamp procedure causes less tissue trauma, less adhesion formation, and less pain, and requires shorter hospitalization and recovery times for women. Another advantage of Doppler-guided uterine artery occlusion is the fact that its success rate is not affected by the surgeon's level of laparoscopic expertise [31].

Intrauterine Ultrasound-guided RF (radio frequency) Ablation of Uterine Fibroids

The VizAblate System (Gynesonics; Redwood City, CA) is a transcervical device consisting of an intrauterine ultrasound probe and a single-use, disposable articulating hand piece. Through intrauterine sonography, fibroids can be accurately localized, and simultaneously ablated via high RF energy delivery [33]. The amount of therapeutic energy delivered to the fibroid relies on a fixed treatment cycle based on fibroid size. A study trial looking at the efficiency of transvaginal RF thermal ablation in treating symptomatic uterine myomas reported a 91% reduction in symptoms and a 46% improvement in overall quality of life; a 73% mean reduction in fibroid volume was also reported [34].

Laparoscopic RF (radio frequency) Ablation of Symptomatic Uterine Fibroids

Providing a less invasive alternative to abdominal hysterectomy in the management of symptomatic fibroids, laparoscopic RF ablation involves fibroids being precisely localized via ultrasound and targeted to high RF energy through monopolar and bipolar single electrocautery needles with multiple hooked arrays. Multiprobe array RF ablation has been associated with high satisfaction rates in the management of liver, lung, and kidney tumors; spherical regions of coagulation necrosis measuring 3.5 cm have been achieved and local tumor control of up to 95% has been reported [35].

RF volumetric thermal ablation (RFVTA) is usually performed in the outpatient setting using the Tulip™ RFVTA system (Halt Medical; Brentwood, CA) supplemented by standard laparoscopic instrumentations. The Halt Medical system consists of three components:

a dual-mode, monopolar RF generator, two dispersive electrode pads, and a sterile electrosurgical probe with a deployable needle electrode array with a probe tip that enables coagulation of the needle tract [36].

Halt Medical's Acessa feasibility study assessed the safety and efficacy of this technique in the management of symptoms secondary to uterine myomas in women; 135 premenopausal women with heavy uterine bleeding due to myomas were recruited [34]. The largest uterine myoma measured 14 weeks of gestation and no single myoma exceeded 7 cm in size. Post laparoscopic ultrasound guided RFVTA, the bleeding outcomes were measured by alkaline hematin analysis at baseline and subsequently 3, 6, and 12 months post procedure ($P < .001$, paired t test).

A higher quality of life was seen in 94% of the women, with a mean transformed score of 37.3 at baseline that improved gradually to 19.5 at 12 months ($P < .001$, paired t test). This was also associated with a mean myoma volume reduction of 45.1% by 12 months. One serious adverse event was reported: one patient required readmission and a second surgical procedure for persistent bleeding [37].

A subsequent study by Robles and colleagues [36] further assessed the efficacy of laparoscopic RFVTA; overall improvement in symptoms and quality of life was also reported. Among the 114 women initially screened, 36 were enrolled and 35 followed for 12 months. All women were premenopausal and were between 33 and 55 years of age. None desired any further children but every woman wished to preserve her uterus. The 36 women recruited had a maximum of six uterine myomas and the largest one measured 6 cm.

At laparoscopy, two trocars were inserted (one infraumbilical and one at the level of the uterine fundus) to accommodate the laparoscope and the ultrasound transducer. Once the pelvis was assessed intra-abdominally, the laparoscopic ultrasound enabled mapping of the myoma. Under laparoscopic guidance, an RF probe was inserted percutaneously into the uterus and the myomas were targeted via ultrasound guidance and the probe was positioned 1 cm into the fibroid. Dual monitors were used to provide simultaneous laparoscopic and ultrasound imaging. Once the target temperature of 100°C was achieved, it was maintained for the duration of the ablation.

As in the Acessa trial, the patients were followed up at 3-month intervals for 1 year. Symptom severity scores reduced gradually and significantly ($P < .05$): baseline (63.3), 3 months (23.1), 6 months (15.4), and 12 months (9.6). Quality of life scores also improved ($P < .05$): baseline (37.3), 3 months (79.9), 6 months (85.1), and 12 months (87.7) [38].

Conclusion

Heavy menstrual bleeding affects a large proportion of women and accounts for a substantial percentage of gynecologic problems. The ultimate goal of any form of treatment of HMB is to reduce menstrual flow in order to improve quality of life. Pharmaceutical therapy has always been considered the first-line treatment. Conservative treatment options are obviously preferred, but certain cases cannot be treated without surgical intervention.

With the advent of newer medical and surgical options, which are proving to be far effective and efficient than the older methods and are associated with greater patient satisfaction treatment of HMB is becoming more easier and satisfactory. Guidelines issued by the Royal College of Obstetricians and Gynecologists acknowledge that HMB is often inappropriately managed and there is a need for further research in order to develop efficient, patient-friendly, and cost-effective drugs.

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