"THE ASSOCIATION BETWEEN BODY MASS INDEX AND ABNORMAL UTERINE BLEEDING IN PERIMENOPAUSAL WOMEN: AN ANALYTICAL STUDY"

By

Dr. MADHURYA NAGESH, MBBS

DISSERTATION SUBMITTED TO

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH, TAMAKA, KOLAR, KARNATAKA – 563 101

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SURGERY (M.S)

IN

OBSTETRICS AND GYNECOLOGY

Under the Guidance of

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"THE ASSOCIATION BETWEEN BODY MASS INDEX AND ABNORMAL UTERINE BLEEDING IN PERIMENOPAUSAL WOMEN: AN ANALYTICAL STUDY" ABSTRACT Background Abnormal uterine bleeding (AUB) is a condition that affects 9-14% of women between the ages of menarche and menopause. In India, the frequency of AUB is 17.9%, and it has a substantial effect on women of reproductive age. AUB accounts for 20% of gynecological consults and 25% of treatments. The 2011 PALM-COEIN classification standardized AUB causes into structural and non-structural categories. Obesity, linked to endometrial hyperplasia and cancer due to chronic anovulation and increased estrogen from adipose tissue, requires further study. Weight reduction can resolve AUB in obese women, emphasizing the need to examine BMI's impact on endometrial pathology in perimenopausal women to improve prevention, early detection, and treatment of endometrial carcinoma. Materials and Methods A total of 62 perimenopausal women who had been diagnosed with irregular uterine bleeding and had been hospitalized to the department of OBG at SDUMC Kolar participated in the current investigations. It was documented that pertinent facts such as age, parity, parental history of cancer, past history of malignancies, signs, and the length of time they lasted were all included. Physical examinations and baseline investigations were conducted, followed by endometrial biopsy for histopathological examination. Patients were divided into two groups: cases (BMI ≥ 25) and controls (BMI 18.5 - 24.99), to compare various parameters including menstrual cycle irregularities, endometrial thickness, and histopathological findings. Results In this research, there were 62 perimenopausal women who had abnormal uterine bleeding. The participants were divided into two groups: 31 cases and 31 controls. Both groups had a similar mean age (~49.79 years) and height, but cases had higher mean weight (80.67 kg) and BMI (31.85 kg/m²) compared to controls (54.75 kg and 21.91 kg/m²). Cases experienced more severe

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Date: **Signature of the Candidate**

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LIST OF ABBREVIATIONS

AKI	Acute Kidney Injury
AUB	Abnormal Uterine Bleeding
BMI	Body Mass Index
CDC	Centers for Disease Control and Prevention
CKD	Chronic Kidney Disease
CT	Computed Tomography
D&C	Dilation and Curettage
DUB	Dysfunctional Uterine Bleeding
EGF	Endothelial Growth Factor
ESRD	End-Stage Renal Disease
FIGO	International Federation of Gynecology and Obstetrics
FMP	Final Menstrual Period
GERD	Gastroesophageal Reflux Disease
GnRH	Gonadotropin-Releasing Hormone
HLRCC	Hereditary Leiomyomatosis and Renal Cell Carcinoma
HMB	Heavy Menstrual Bleeding
ITP	Idiopathic Thrombocytic Purpura
IUDs	Intrauterine Devices
LNG-IUS	Levonorgestrel-Releasing Intrauterine System
MRI	Magnetic Resonance Imaging
NASH	Non-Alcoholic Steatohepatitis
OHS	Obesity Hypoventilation Syndrome

ORG	Obesity-Related Glomerulopathy
OSA	Obstructive Sleep Apnea
PBAC	Pictorial Blood Loss Assessment Charts
PCOS	Polycystic Ovary Syndrome
PDGF	Platelet-Derived Growth Factor
PID.	Pelvic Inflammatory Disease
RFA	Radiofrequency Ablation
SERMs	Selective Estrogen Receptor Modulators
SIS	Saline Infusion Sonography
SPRMs	Selective Progesterone Receptor Modulators
STRAW	Stages of Reproductive Aging Workshop
VEGF	Vascular Endothelial Growth Factor
vWF	von Willebrand Factor
WHO	World Health Organization

ABSTRACT

"THE ASSOCIATION BETWEEN BODY MASS INDEX AND ABNORMAL UTERINE BLEEDING IN PERIMENOPAUSAL WOMEN: AN ANALYTICAL STUDY"

ABSTRACT

Background

Abnormal uterine bleeding (AUB) is a condition that affects 9-14% of women between the ages of menarche and menopause. In India, the frequency of AUB is 17.9%, and it has a substantial effect on women of reproductive age. AUB accounts for 20% of gynecological consults and 25% of treatments. The 2011 PALM-COEIN classification standardized AUB causes into structural and non-structural categories. Obesity, linked to endometrial hyperplasia and cancer due to chronic anovulation and increased estrogen from adipose tissue, requires further study. Weight reduction can resolve AUB in obese women, emphasizing the need to examine BMI's impact on endometrial pathology in perimenopausal women to improve prevention, early detection, and treatment of endometrial carcinoma.

Materials and Methods

A total of 62 perimenopausal women who had been diagnosed with irregular uterine bleeding and had been hospitalized to the department of Obstetrics and Gynaecology at R.L. Jalappa Hospital and Research Centre, Kolar participated in the current investigations. It was documented that pertinent facts such as age, parity, parental history of cancer, past history of malignancies, signs, and the length of time they lasted were all included. Physical examinations and baseline investigations were conducted, followed by endometrial biopsy for histopathological examination. Patients

were divided into two groups: cases (BMI ≥ 25) and controls (BMI 18.5 - 24.99), to compare various parameters including menstrual cycle irregularities, endometrial thickness, and histopathological findings.

Results

In this research, there were 62 perimenopausal women who had abnormal uterine bleeding. The participants were divided into two groups: 31 cases and 31 controls. Both groups had a similar mean age (~49.79 years) and height, but cases had higher mean weight (80.67 kg) and BMI (31.85 kg/m²) compared to controls (54.75 kg and 21.91 kg/m²). Cases experienced more severe menstrual irregularities, frequent cycles, heavier bleeding, and higher incidences of dysmenorrhea, diabetes, hypothyroidism, and OC pill usage. Biopsies showed more complex endometrial patterns and higher carcinoma rates in cases, with higher mean endometrial thickness (19.71 mm vs. 14.00 mm). Obese individuals had significantly thicker endometria than overweight ones.

Conclusion

The study showed that perimenopausal women with higher BMI (≥25) had more severe menstrual irregularities, including frequent, prolonged cycles, heavier bleeding, and higher rates of abdominal pain, white discharge, diabetes, and hypothyroidism. Biopsies revealed more complex endometrial patterns and higher rates of hyperplasia and carcinoma.

Keywords

Body Mass Index, Abnormal Uterine Bleeding, Perimenopausal Women, Analytical Study

INTRODUCTION

INTRODUCTION

Abnormal uterine bleeding (AUB) includes any deviations from typical menstrual patterns such as irregularity, frequency, duration, and volume.[1] In India, the incidence of AUB is 17.9%, and it affects an estimated 9-14% of women between the ages of menarche and menopause.[2,3] It significantly impacts women of reproductive age, contributing to 20% of gynecological consultations and 25% of procedures, affecting quality of life, productivity, and incurring substantial economic costs due to treatments.[4,5] The inconsistent terminology and definitions of AUB have historically complicated communication among healthcare providers and hindered clinical research.[6]

AUB manifests in various forms like excessive or scanty bleeding, short or prolonged bleeding, and unpredictable bleeding patterns. About 90% of cases result from anovulation, leading to inadequate progesterone and corpus luteum deformation. Anovulation is closely linked with endometrial cancer and hyperplasia, especially in perimenopausal and menopausal women.[7,8]

Despite its prevalence, AUB remains poorly understood due to inconsistent terminology. The 2011 PALM-COEIN classification by the FIGO aimed to standardize AUB nomenclature, categorizing causes into structural and non-structural origins.[9] Nevertheless, some gaps have been left regarding the analysis of the causes and their exact impact on AUB. More research needs to be done to establish the correlation between obesity and AUB, especially in terms of the probability of endometrial cancer. Obesity, stress, eating disorders, nulliparity, polycystic ovary syndrome and estrogen

replacement therapy are considered to be risk factors; however, there is a need for more understanding of these factors and their relation to each other.[10]

As there is a significant increase in cases of obesity and knowing that obesity will affect reproductive health, it is necessary to define how high BMI may affect AUB. Endometrial hyperplasia and cancer are prevalent diseases in obese women because obesity is one of the chronic anovulation and hyperestrogenism causes that result from increased estrogen production in adipose tissue. Research that has been carried out proof that anovulation and AUB in morbidly obese women can be corrected post-bariatric surgery, the normal menstrual cycle will normalcy in 50% of the obese women after they have lost weight.[11]

As a result, it is essential to investigate the relationship between BMI and endometrial pathology, particularly in the population of perimenopausal women who have an AUB. The purpose of this research is to ascertain the BMI of these women, analyze the various endometrial histopathological trends, and assess the relationship between BMI and endometrial pathological conditions. Understanding these correlations may aid in the development of effective techniques for recognizing and treating atypical and carcinomatous alterations in the endometrium of perimenopausal women who are overweight or obese. This will eventually lead to improvements in the prevention, early identification, and treatment of carcinoma of the endometrium.

AIMS & OBJECTIVES

AIMS & OBJECTIVES OF THE STUDY

- ***Research Question***
  - "How does the body mass index and abnormal endometrial pathology in perimenopausal women with abnormal uterine bleeding correlate with each other?

- ***Research Hypothesis***
  - Body mass index should be the first stratification in the decision to perform endometrial biopsy in perimenopausal women with abnormal uterine bleeding as higher body mass index correlates with abnormal endometrial pathology

- ***Objectives***
  - To determine the body mass index of the perimenopausal women with abnormal uterine bleeding
  - To evaluate the different endometrial histopathological patterns in perimenopausal women with abnormal uterine bleeding
  - To identify the association between body mass index and endometrial pathology in perimenopausal women with abnormal uterine bleeding"

REVIEW OF LITERATURE

REVIEW OF LITERATURE

ABNORMAL UTERINE BLEEDING

The term "Abnormal Uterine bleeding" refers to variations in the patterns of menstrual cycles that occur outside of pregnancy. These deviations might include inconsistencies in the frequency, regularity, length, and amount of menstrual flow. This condition affects as many as one-third of all women at some time in their lives, particularly during menarche and the perimenopause. A normal menstrual cycle lasts between two to seven days, occurs every twenty-four to thirty-eight days, and results in a loss of blood that ranges from five to eighty milliliters. Variations that deviate from these characteristics are referred to be AUB.

The AUB is defined by a number of clinical characteristics. If a woman's menstrual cycle is fewer than 24 days, it is considered frequent, once every twenty-four to thirty-eight days is considered normal, while once every thirty-eight days or more is considered in frequent. When there is no bleeding, the period is considered regular, when there is a fluctuation between ±2 to 20 days, and when there is a variance of more than 20 days during a 12-month period, the period is considered irregular. Periods are considered protracted if they last more than eight days, normal if they last between four and eight days, and short if they last less than four and a half days. If 80 milliliters or more of blood loss , it is considered heavy loss; if 5 to 80 ml is considered normal; and if less than 5 ml is considered light loss, it is considered light.[12]

Disorders in uterine bleeding are described using specific words. A menstrual cycle duration of fewer than 21 days is referred to as polymenorrhoea, whereas a cycle length of more than 35 days is called oligomenorrhoea. Menorrhagia involves a normal cycle length but with profuse bleeding (more than 80 milliliters) or extended duration (more than 7 days). Menometrorrhagia denotes irregular and unpredictable bleeding with increased flow or duration. Amenorrhoea is the absence of monthly bleeding for more than 6 months in reproductive-aged women. Metrorrhagia refers to intermittent bleeding between cycles, and midcycle spotting is minimal bleeding before ovulation. Postmenopausal bleeding occurs in women who have not had a period for more than a year. Acute emergent AUB involves excessive bleeding causing hemodynamic changes like increased heart rate or decreased blood pressure. Dysfunctional Uterine Bleeding (DUB) is abnormal bleeding without any identifiable cause.[13,14]

There are acute and chronic types of AUB. It is possible for acute AUB to develop either on its own or in conjunction with chronic AUB; either way, it causes excessive bleeding that requires prompt medical attention to stop the bleeding from becoming worse. When unexpected bleeding in volume, consistency, or time has continued for the majority of the last six months, it is referred to as chronic AUB. Understanding these definitions helps in diagnosing and managing AUB effectively.

ETIOLOGY [15-17]

In order to classify the root reasons behind AUB, the "PALM-COEIN system was developed by the International Federation of Obstetrics and Gynecology" (Figure 1).

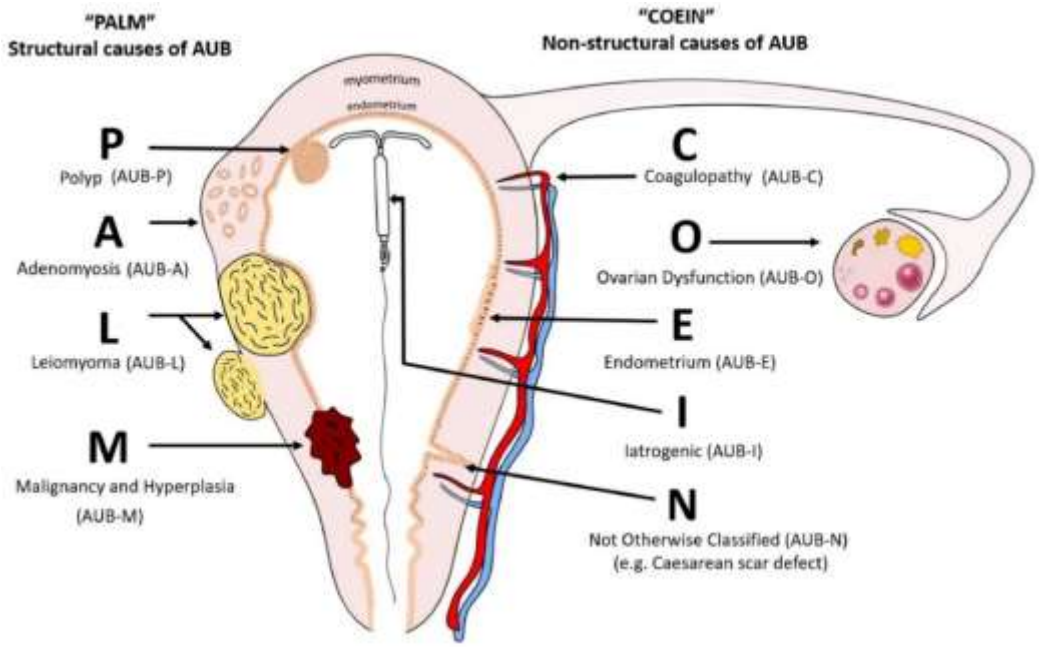

Figure 1: "FIGO classification of causes of AUB"

- **Polyps (AUB-P):** These are proliferations of endometrial stromal and glandular tissues, typically identified via ultrasound, saline infusion sonography (SIS), or hysteroscopy.

- **Adenomyosis (AUB-A):** A common complication of leiomyomas, pelvic endometriosis, and endometrial carcinomas is the presence of endometrial tissue inside the myometrium, which causes this syndrome.

- **Leiomyoma (AUB-L):** Fibroids can cause AUB through various mechanisms: increased endometrial surface area, fragile vessels around fibroids leading to heavier flow, and molecular changes that alter vasoactive substances. Fibroids also elevate levels of matrix metalloproteinase 2 and 11, enhancing lytic enzyme release. Angiogenesis is promoted by increased VEGF, basic fibroblast growth factor, heparin-binding EGF, and PDGF. Additionally, alterations in plasminogen modulators and inflammatory changes involving IL-13, IL-17, and IL-10 contribute to endometrial damage.

- **Malignancy (AUB-M):** AUB can be a symptom of malignancies such as endometrial and cervical cancer, uterine sarcoma, or result from long-term tamoxifen use, previous pelvic radiation treatment, and HLRCC.

- **Coagulopathy (AUB-C):** Coagulation conditions like Von Willebrand disease, acquired idiopathic thrombocytic purpura (ITP), and drug-induced conditions (e.g., from heparin or coumarin) can present as AUB.

- **Ovulatory (AUB-O):** Ovulatory dysfunctions are often due to unopposed estrogen action, causing endometrial hyperplasia. Conditions associated include polycystic ovarian disorder, hypothyroidism, hyperprolactinaemia, obesity, and anorexia.

- **Endometrial (AUB-E):** These causes stem from abnormal prostaglandin secretion leading to defective hemostasis, with specific conditions such as tubercular endometritis and chlamydial infection.

- **Iatrogenic (AUB-I):** AUB can be induced by medications such as estrogen or progestin supplements, GnRH agonists, IUDs, aromatase inhibitors, SERMs, and SPRMs.

- **Not otherwise classified (AUB-N):** In addition to the aforementioned conditions, myometrial hypertrophy, endometrium pseudoaneurysms, chronic ovarian cysts and cesarean scar abnormalities are other causes of AUB.

MENSTRUAL BLOOD LOSS – MEASUREMENTS [18-20]

- **The Alkaline Hematin Test**

  This process involves removing hemoglobin from tampons, transforming it into hematin, and then measuring the result using spectrophotometry. But alternative methods are more popular and it is hardly employed.

- **Pictorial Blood Loss Assessment Charts (PBAC)**

  Heavy menstrual bleeding is defined as a PBAC score more than 100, which indicates more than 80 mL of blood loss according to Higham's grading method. It is an accurate way to gauge hemorrhage.

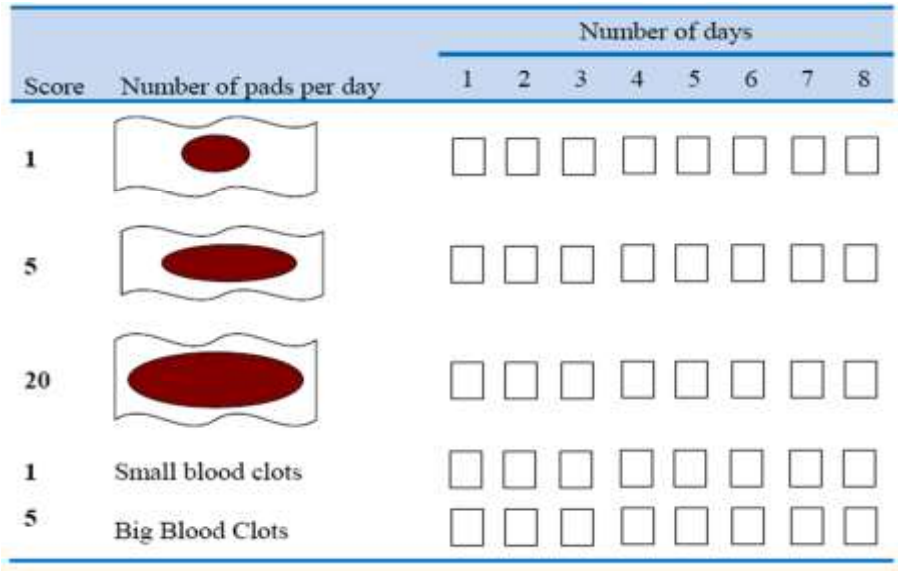

Figure 2: Pictorial Blood Loss Assessment Chart

- **Self-assessment measures**

  Self-assessment includes symptoms such as unusually heavy bleeding, bleeding lasting more than seven days, pad flooding, and passage of clots larger than 3 cm.

EPIDEMIOLOGY [21,22]

An abnormal uterine hemorrhage occurs most often during menarche and perimenopause, however it affects 3- 30% of reproductive-age women worldwide. Although most research focuses on HMB, the incidence rises to more than 35% when irregular and intermenstrual bleeding are also included. It is difficult to ascertain the precise prevalence due to the mix of subjective and objective diagnostic criteria, as well as the fact that many women do not seek medication. In India, AUB is a significant health concern, affecting an estimated 12-25% of women at some point, with 3-5% experiencing HMB.

PATHOPHYSIOLOGY [23-25]

Uterine and ovarian vessels are responsible for supplying blood to the uterus. These arteries then divide into "arcuate arteries and radial branches, which are responsible for supplying blood to the two layers of the endometrium, which are the functionalis and basalis layers. A decrease in progesterone levels at the end of the menstrual cycle causes the functionalis layer to be broken down by enzymes, which results in the release of blood and the sloughing that is characteristic of menstruation". Platelets and thrombin that are operating properly, together with artery vasoconstriction, are responsible for controlling blood loss. AUB may be caused by a number of different factors, including structural abnormalities of the uterus such as "leiomyoma, polyps, adenomyosis, malignancy, or hyperplasia, disorders of the coagulation system (coagulopathies or drug-induced), or disturbances of the hypothalamic-pituitary-ovarian axis (due to ovulatory/endocrine disorders or medications)".

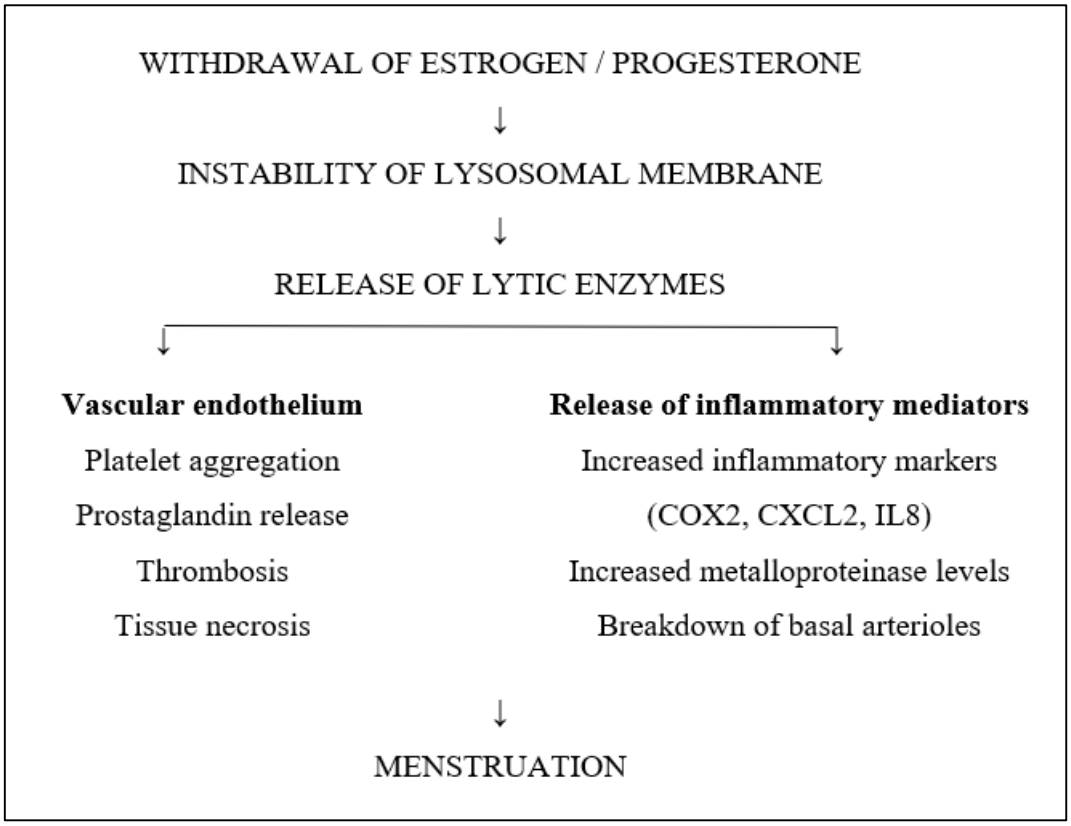

Figure 3: Flow chart depicting the mechanism of normal menstruation

CLINICAL EVALUATION [26,27]

When a patient presents with menstrual complaints, a clinician should gather a comprehensive history covering several key areas.

The history of menstruation should contain the following information: the age at which the woman first became menstrual, the date of the last menstrual cycle, the frequency, regularity, length, volume of menstrual flow, and any incidents of postcoital or intermenstrual bleeding. In addition to obstetrical history (number of births and delivery techniques), fertility concerns, current contraception, history of sexually transmitted infections (STIs), and Pap smear history, information about sexual and reproductive history is relevant.

Weight loss, discomfort, discharge, problems with the bowels or bladder, indicators of anemia, blood disorders, and endocrine abnormalities are some of the associated symptoms and systemic signs that should be taken into consideration to identify. It is essential to keep a record of all the drugs that the patient is currently following. In the event that there is a family history of coagulation disorders, malignancies, or endocrine diseases, the doctor needs to conduct an investigation. The patient's social profile should include information on their work, the effect of their symptoms on their quality of life, and whether or not they have used tobacco, alcohol, or drugs. Keeping a record of any previous surgical procedures is also required.

The medical checkup should include the patient's vital signs (blood pressure, body mass index, etc.), symptoms of pale skin, and indications of endocrine abnormalities (such as hypothyroidism, alopecia, acne, moon facies, uneven fat distribution, striae, etc.). In addition to looking for lumps in the abdomen and coagulopathy symptoms like bruising or petechiae, the doctor should undertake a pelvic exam that may include a Pap smear, sexually transmitted infection evaluation, and an endometrial test if necessary.

DIFFERENTIAL DIAGNOSIS [28-30]

It is crucial to exclude genitourinary or gastrointestinal tract bleeding as a possible cause of atypical uterine bleeding when making the diagnosis of a differential. Germinal tract bleeding may start in a number of different places in the body, including the vulva (from benign growths or cancer), the vagina (from trauma, foreign materials, cancer, STIs, or benign growths), or the cervix (from malignancies, STIs, or benign growths). The causes of urinary tract bleeding might include infections or cancer, while pelvic

inflammatory diseases or tumors can cause bleeding from the fallopian tubes and ovaries. Some of the possible causes of gastrointestinal hemorrhage include Behçet syndrome as well as inflammatory bowel disease. One must also consider pregnancy complications; for instance, placenta previa, ectopic pregnancy, or miscarriage. Finally, the bleeding might originate in the uterus because of various disorders associated with the uterus.

DIAGNOSIS [31-33]

Some of the laboratory studies that can be used to diagnose irregular uterine bleeding are complete blood count, platelet counting, and coagulation profile in cases of coagulopathy. Beta-HCG is used in pregnancy diagnosis. TSH is used to diagnose thyroid diseases while liver function test and prothrombin time determinations are used to diagnose liver illness. The existence of a pituitary adenoma may be revealed with the help of prolactin levels, and diabetes mellitus – through blood sugar levels. There are possibilities of detecting ovarian or adrenal tumors with the help of DHEAS, Free testosterone and 17-OH progesterone. Papanicolaou smears check cervical dysplasia, while cervical tests diagnose cervicitis as well as Pelvic Inflammatory Disease (PID) .

Hysteroscopy, endometrial aspiration, dilatation, and curettage are used in evaluating hyperplasia or atypia, or cancer in cases of AUB. Transvaginal ultrasound can show the presence of cancers in the uterus, or in the ovaries or both. Endometrial lesions such as intracavitary spots, polyps, and submucosal tumors can be seen using saline infusion sonohysterography and hysteroscopy.

COMPLICATIONS [34,35]

The causes of chronic abnormal uterine bleeding include; Anemia, infertility and endometrial cancer may develop from long-term abnormal uterine bleeding. Acute AUB can result in severe anemia, hypotension, shock, and possibly death if left untreated and appropriate management is not provided .

MANAGEMENT [36-38]

Elements including patient stability, fertility choices, and medical conditions determine AUB treatment. The article under discussion emphasizes the general need to tailor the treatment strategies to individual patients, and the medical decisions are often the starting point for this process.

- **Conservative management**

Conservative management of AUB includes both non-hormonal and hormonal treatments. Non-hormonal options encompass NSAIDs, tranexamic acid, and ethamsylate, while hormonal treatments involve progestogens, oral contraceptive pills, danazol, and GnRH analogues. Additionally, a levonorgestrel-releasing intrauterine system and selective estrogen receptor modulators (SERM) like ormiloxifene are also utilized.

- **Minimally invasive surgery**

  - ***Abalative technique***

    Ablative techniques are medical procedures used to remove or destroy tissue. These techniques are commonly employed in treating various conditions, including cancers and cardiac arrhythmias. Ablation can be achieved using different energy sources such as heat, cold, lasers, or chemicals. The evolution of these techniques is often categorized into generations, each marked by advancements in technology and clinical outcomes.

    - ***1st generation***

      The first generation of the ablative techniques was based on the thermal methods of tissue removal. One technique that was popular this generation is radio-frequency ablation or else known as RF ablation. Developed in the last quarter of the 20th century, RFA employs electrical currents of high frequencies to produce heat, negating on the affected tissues. This method was widely applied as effective for the treatment of diseases such as liver tumors and cardiac arrhythmias. While first-generation techniques provided good results in the methodology, some inconveniences occurred, such as affecting adjacent tissue and working with low accuracy regarding particular zones.

- ***2nd generation***

Second generation of the use of ablative techniques is much safer and seems to be more accurate. Technological improvements of the equipment used in these procedures like MRI, and CT scans make the procedures more accurate. One is the cryoablation whereby tissues or organs are frozen to destruction, thus coming as a reprieve from heat based treatments. This kind of ablation is best suited in cases of kidney and prostate cancer due to renal preservation and minimized harm to the surrounding tissue.

Other types of the second-generation techniques include microwave ablation. This method employs electromagnetic waves to produce heat and this makes it to penetrate the human tissues to a deeper level and at the same time have a better ablation profile than RFA. Microwave ablation is good for tumors of greater size and has given good results in the treatment of lung and liver cancers. Also, robust integration of robotic and computer-assisted systems has become rampant within that field. Such systems make it easier to control the amounts of ablative energy provided to tissues and thereby reduce the occurrence of complications in patients.

- **Surgical management**

Hysterectomy

PERIMENOPAUSE [39,40]

Perimenopause can be described as a menopausal transition characterized by the likelihood of presenting various worrying signs of a reduced ovary function; that period usually begins at the age of forty-one and lasts up to two years after the Final Menstrual Period (FMP). The uncertainty and the variation in defining perimenopause are a common cause of difficulty in clearly differentiating between non-cyclic abnormal uterine bleeding and 'perimenopausal' and 'postmenopausal' categories.

The WHO's definition of perimenopause was given in the year 1996 and it described it as the stage before the onset of menopause and defined it more as the initial clinical manifestations of menopause up to one year after the occurrence of menopause. Focusing on the fact that hormonal changes that precede the onset of menopause are observed at a certain age, this delineation emphasizes this period.

But at the same time, the terminologies regarding menopausal transition are quite complicated. The term 'menopausal transition' constitutes puberty to the FMP, which is the time when menstrual cycle abnormalities are increasingly reported. This phase is defined by irregular cycles and their measures and differs from the first stage of perimenopause.

There exist multiple researches that have used different age limits to define perimenopause. For instance, some of the studies randomly decide the perimenopausal stage to be between 40 to 54 or 42 to 52 years. Other works suggest a time frame that ranges from four years before the FMP to one year after it, Such differences are due to

the nature of perimenopause which has many facets and is not easy to define mainly due to individual differences.

These findings indicate that there is no conclusive agreement on the specific age demarcation and the sign and symptoms that characterize perimenopause, a situation that justifies the subjective approach when managing patients clinically. Every woman has a different experience of perimenopause depending on one's genetic, biological, and environmental predispositions. Thus, patient care in perimenopause means taking into account numerous symptoms and possibilities of their manifestations, as well as the specificity of their treatment.

In conclusion, perimenopause can be characterized as a complex and highly personalized stage in a woman's life characterized by hormonal fluctuations and irregular periods that occurs starting in the early forty years. There is no definite consensus, though; most agree that it covers the time from the first pointers of ovarian function decrease up to one or two years following the FMP. It is important to look at these differences when promoting and delivering competent health care services to women experiencing this phase in their lives.

STRAW CLASSIFICATION (2012) [41,42]

The STRAW classification which was revised in 2012 also offers an ideal organ for demystifying the stages of reproductive aging in women. This classification is also helpful when it comes to the analysis of clinical practices and further research as it defines what the period of reproductive years means and what is defined as postmenopausal period.

Reproductive Stage:

The system begins with the reproductive stage; with sub-phases of early, peak, and late reproductive stage according to menstrual cycles and hormonal stability.

Menopausal Transition:

Menopausal transition is the particular period of interest because it is associated with fluctuations, including hormonal ones, and menstrual cycle irregularity. The transition is divided into the early and the late transition stages. Early transition is accompanied by irregularity which is evidenced by changes in cycle length while the late transition is characterized by prolonged intervals of a menstrual cycle, which is 60 days or more and is referred to as amenorrhea.

Menopause and Postmenopause:

According to the criteria of clinical practice, menopause is considered as occurrence of the last menstrual cycle, with exclusion of a possibility of pregnancy after the absence of menstruation for 12 months. Postmenopause is the stage following menopause and is implemented into groups of early post menopausal and late where the changes in health and hormones are found to be more prolonged.

The STRAW+10 update in 2012 refined these criteria to enhance the accuracy and applicability of the classification, incorporating recent scientific advances and clinical observations. This system aids healthcare providers in diagnosing and managing conditions related to reproductive aging, ensuring better patient care through a clear understanding of the reproductive lifespan.

ABNORMAL UTERINE BLEEDING IN PERIMENOPAUSAL AGE GROUP [43-45]

Consequently, abnormal uterine bleeding during perimenopause is a considerable clinical problem; it is characterized as any variation in menstrual bleeding patterns during menopausal transition or within the first year after menopause, except for cyclic bleeding that results from hormone replacement therapy. AUB is a common complaint, with about a third of outpatient gynecological referrals, most commonly perimenopausal. AUB is reported to affect at least one episode in 90% of women in their accessing menopause, with 78% reporting at least three episodes.

Essentially, the pattern of distribution of specific causes of AUB varies with age, while endometrial polyps and fibroids are the most frequently reported structural causes in perimenopausal women. Myomas and adenomyosis are common causes of AUB, and these conditions also commonly present after the fourth decade of woman's life. The cases of endometrial polyps are most often identified in women of 40–44 years of age. Furthermore, leiomyomas or fibroids, endometrial and ovarian cancers, polyps, and adenomyosis are other structural diseases prevalent in the aging, especially with malignant diseases of the uterus.

Several local or systemic factors and some medications can also cause uterine bleeding. Tamoxifen as a hormonal medication and others that are non hormonal for example oral anticoagulants are some of the causes. Abnormalities in the blood coagulation system rank high as the cause of AUB in perimenopausal-age women. There are several identified coagulopathies associated with the development of AUB; these include, vWF deficiency, platelet dysfunction and deficiencies in rare clotting factors of which vWF deficiency is the most common estimated to affect up to 0.5% to

1% of the general population. This condition affects women and they note AUB as a cardinal feature in 32-100% of the cases While, platelet dysfunction and other deficiencies accounted for 5-98% and 35-70% of the cases respectively.

Thus, the reproductive options for women over forty years are rather complex. The probability of a woman conceiving spontaneously reduces dramatically with age, but even at "40-44 years, the odds are 10 percent, and at age 45-49 years , only 3 percent, many women still successfully conceive and give birth in their fourth decade. But the risk is high and 84% of the pregnancies in women over 48 years result in first trimester miscarriage and the rate of ectopic pregnancy in women over 44 years is 7%". Due to these reasons , it is mandatory to rule out pregnancy in the evaluation of AUB up to 1 year after the last menstrual period.

Overall, AUB during perimenopause is a multifaceted issue with significant implications for women's health. Its high prevalence and diverse etiologies necessitate a thorough and personalized diagnostic and management approach to ensure optimal outcomes for affected women.

BODY MASS INDEX [46-50]

Body mass index (BMI) uses an adult's height and weight to categorize individuals as underweight, normal weight, overweight, or obese.

DEVELOPMENT

The Belgian sociologist, astronomer, mathematician Lambert Adolphe Jacques Quetelet introduce the term in the middle of 19th century. Thus, Quetelet tried to associate a person's height with the person's best weight for large groups of people for research. The first time the use of BMI quotient was mentioned was in 1972 in the Journal of Chronic Diseases, where it was pointed out that this method is useful in social physics, which is Quetelet's term for population studies. Initially not designed for the purposes of the individual assessment, its basic structure has made it the most utilized anthropometric analysis presently.

Unlike other anthropometric assessments that are designed from unique body features and are therefore contingent on the station where the assessment is carried out, BMI offers a much accurate and consistent appraisal more so since it only relies on weight appraisal. Such consistency and simplicity are the reasons why a quotient designed in the years of the Industrial Revolution is still effectively utilized in the 21st century for assessing body weight categories.

ASSESSMENT

Another important factor that can be calculated is a person's body mass index commonly abbreviated as BMI which is essential in determining possible risks of an individual experiencing certain health problems and is used extensively for preparing policies on the national and international level in the field of public health. BMI can measured in kilograms and meters and marked also in pounds and inches. This is the ratio of weight in "kg to square of height in meters, which is denoted by the symbol kg/m2 when using metric units of measurement. The formula for calculating the imperial unit of measurement is as follows: divide the weight in pounds by the height in inches squared, and then multiply the result by 703 (Using the formula $703 \times lbs/in^2$).

Knowledge of BMI classification by WHO and CDC is important in determining the health message of BMI and associating health risks. The World Health Organization (WHO) provides a classification of body mass index, which is described below. These categories are based on body mass index, and they are as follows: The common categories include: Severely underweight which is less than 16 kg/m^2, underweight which is 16.0-18.4 kg/m^2, Normal weight which is 18.5-24.9 kg/m^2, Overweight which is 25-29.9 kg/m^2, moderately obese which is 30-34.9 kg/m^2 and severely obese which is 35 and above and morbidly obese (>40.0 kg/m^2) . CDC More specifically, these are; those with a BMI of equal to or less than 18, which is regarded as underweight< 18. 4 kg/m^2 while those with normal weight should be of (18. 5 to 24.9 kg/m^2) , and those who are overweight, (23.0 – 27.5 kg/m^2), and obese (>40 kg/m^2)

For children and teens aged 2 to 20, the CDC uses percentiles to determine BMI categories: as underweight, to below the 5th percentile of the BMI, healthy weight,

between the 5th and 85th percentiles, overweight between 85th and 95th percentiles and obese of greater than the 95th percentile. The WHO also provides criteria specific to Asian populations: underweight (<18.5 kg/m²), normal weight (18.5-23.0 kg/m²), overweight (23.0-27.5 kg/m²), and obese (≥27.5 kg/m²).

ISSUES OF CONCERN

Because of this, body mass index (BMI) is a measurement of body fat in proportion to an individual's frame, but it does not reflect the percentage of body fat. Especially in athletes who have a high lean body mass or in persons who have a larger fat mass, it might provide an inaccurate representation of the amounts of body fat. Furthermore, it does not account for visceral obesity, a significant risk factor for various health conditions associated with increased morbidity and mortality.

The calculation of BMI squares height to mitigate the effect of leg length in taller individuals, as most body mass is in the trunk. However, this normalization limits its utility across different body types and inadequately assesses bodyweight health in shorter individuals, failing to consider gender differences in body composition. Research involving 13,601 subjects showed discrepancies between BMI-defined and body fat-defined obesity, revealing that BMI has high specificity but low sensitivity in confirming obesity.

In elderly populations, higher BMI does not correlate with increased mortality; rather, a low BMI (<23.0 kg/m²) is linked to higher mortality risk. Unexplained weight loss in older adults requires immediate clinical attention. For critically ill patients, BMI

is unreliable due to weight fluctuations and should not guide treatment or predict outcomes. With lower BMI values, Asian people have been shown to have greater levels of body fat and cardiovascular hazards than white cultures' BMI values. Consequently, the World Health Organization (WHO) recommends adjusted BMI cut-off points for Asian populations.

CELLULAR LEVEL

There are links between BMI and the formation of cancer cells at the cellular level, which may influence a variety of illness conditions. For example, Bellows et al. discovered that persons with a body mass index (BMI) more than 30 had a considerable increase in the number of circulating progenitor cells, which indicates a higher risk for the formation of tumors and the advancement of cancer. Preethi et al. conducted another research on males between the ages of 18 and 25 and discovered that body mass index (BMI) is a more accurate predictor of resistance to insulin than waist circumference.

A global study in Diabetes Care found a strong positive correlation between BMI and insulin resistance in women, highlighting the increased risk of type 2 diabetes and other metabolic disorders associated with higher BMI. Research specific to Indian women revealed that even within the normal BMI range, higher levels of insulin resistance were present, suggesting a need for adjusted BMI thresholds for this population.

A higher body mass index (BMI) results in an increase in the number of adipocytes and stored energy at the cellular level. There is a correlation between having

10 kilos of extra weight and an increase in beta cell mass of 10 to 30 percent, which leads to an increase in insulin release and, eventually, inflammation and diabetes. In addition, a research that included more than one million women discovered a significant correlation between a higher body mass index (BMI) and an increased chance of developing cancer, which includes breast, colorectal, and endometrial cancers. Consequently, this highlights the worldwide need for initiatives to lower the risks of cancer that are associated with obesity.

ORGAN SYSTEMS INVOLVED

The likelihood of developing hypertension, elevated cholesterol levels, and diabetes, all of which are important risk factors for coronary heart disease, is dramatically increased when the body mass index (BMI) is high. In the respiratory system, high BMI is linked to Obesity Hyperventilation Syndrome (OHS) and Obstructive Sleep Apnea (OSA), both contributing to respiratory complications and cardiovascular issues.

A greater body mass index (BMI) is linked to an increased risk of gallbladder illness, colon cancer, GERD, and NASH in the gastrointestinal tract. The latter is associated with inflammation and scarring caused by fat buildup in the liver, and it is a major cause of chronic liver disease in the United States.

Hypertrophy of adipose tissue, disruption of hormone balance, and insulin resistance are all consequences of obesity that raise the danger of heart disease and diabetes, especially type 2 diabetes. One factor that contributes to these diseases is the

production of free fatty acids by excess adipose tissue. In the integumentary system, increased adipose tissue raises the risk of immune-mediated conditions like hidradenitis suppurativa and psoriasis. Conversely, a low BMI may result in dry, thickened skin and fine hair growth (lanugo).

In the genitourinary system, obesity increases the likelihood of acute kidney injury (AKI), chronic kidney disease (CKD), and end-stage renal disease (ESRD). Proteinuric obesity-related glomerulopathy (ORG) and nephrolithiasis (kidney stones) are also more common. Female urinary incontinence is strongly associated with obesity.

High BMI is linked to reduced reproductive function. Women with a BMI over 30 kg/m² face higher incidences of anovulation and subfertility, and are more prone to reproductive cancers, including breast, prostate, endometrial, and ovarian neoplasms. A decrease in gonadotropin-releasing hormone (GnRH) and the development of irregular or anovulatory cycles are both brought on by obesity, which also causes an increase in the aromatization of androgens to estrogens. Menstrual dysfunction is three to four times more common in obese women.

Obesity in males may lead to reproductive problems because it increases levels of reactive oxygen species and inflammatory cytokines, which can break down sperm DNA. Obesity may alter the epigenetic and endocrine content of sperm and seminal fluid, potentially affecting early fetal development.

OBESITY AND ABNORMAL UTERINE BLEEDING [51-53]

The link between obesity and reproductive function has been known for centuries. Hippocrates noted that individuals with a certain body type often struggled with fertility issues, citing excess body fat as a key factor. Today, obesity, defined by a BMI over 30 kg/m^2, is a global health crisis with a rising prevalence.

The risk of a number of diseases and disorders, including malignancies (including breast, colon, and endometrial cancer), osteoarthritis, and cerebrovascular disease, is greatly increased in those who are obese. These ailments include type 2 diabetes, hypertension, ischemic heart disease, and cancers. Additionally, the danger of death is increased. An increase in body mass index (BMI) of 5 kilograms per square meter is associated with a thirty percent increase in the overall mortality risk, according to a meta-analysis of 57 prospective studies that included 894,576 individuals. A rise of forty percent in vascular mortality, an increase of more than fifty percent in cases of diabetic, renal, and hepatic mortality, a rise of ten percent in cases of neoplastic mortality, and a rise of twenty percent in cases of respiratory and other mortality are included in this.

According to the findings of the Health Survey for England, as of the year 2016, 26% of adult males and 27% of adult females in England were obese. This figure represents an increase from 15% in 1993 but has been steady since 2010. These percentages are lower than those in the United States, where statistics from 2013-2014 revealed that the prevalence of obesity among males was 35 percent, and among women, it was 40.4 percent. In the general population, the rates of obesity are comparable to those that are seen among pregnant women. It was found in the

MBRACE-UK study on maternal fatalities from 2013 to 2015 that 34 percent of women who passed away had a body mass index (BMI) of 30 kg/m2 or greater. In the United Kingdom, around twenty percent of pregnant women are obese.

The risks associated with obesity during pregnancy are well-documented, highlighting the seriousness of this issue. Also, the trend in child and adolescent obesity remains alarming, with 20 groups of 14-year old children in UK defined as obese, setting them to higher risks of different health issues.

Evidently obesity has close effects with variety of organs including reproductive organs. On the reproductive health context, it has negative impacts leading to common GI disorders such as menstrual disorders, subfertility, and pregnancy complications. Changes in the global diet patterns also witnessed the rise in numbers of obesity and due to the numerous adverse health effects, an urge to control the obesity epidemic is felt.

OBESITY AND POLYPS [54,55]

It is well-established that there is a connection between obesity and the development of endometrial polyps in premenopausal women. This suggests that obesity is a key risk factor among these circumstances. Eighty-two percent of premenopausal women who had endometrial polyps reported experiencing abnormal uterine bleeding, according to a study of these individuals. Within the context of these particular instances, obesity was shown to be a significant risk factor for the development of endometrial polyps, particularly when it was combined with arterial hypertension.

This link is further supported by a retrospective study conducted to compare the prevalence of obesity in women with endometrial polyp to those without endometrial polyp. The study showed that women with the endometrial polyps had a significantly higher prevalence of obesity as compared to the women who did not have the polyps. This is enough proof that there is a positive correlation between the rise in body weight and the chance of getting these polyps. In the context of infertility, one was able to determine that body mass index BMI was a factor that predisposed individual to development of endometrial polyps. Based on this discovery, the study indicates that women who are obese are more likely to get these growths.

The other possible factors are the raised blood estrogen levels that exist due to obesity in women. Thus, estrogens are derived from androgens by the action of aromatase enzyme that is secreted by adipose tissue that acts as an endocrine gland. This process leads to increased levels of estradiol, especially in women who have a greater body weight. Both the amounts of estradiol and the length of time that an individual is exposed to estrogen without any competition tend to grow as the body's weight increases. It is possible that prolonged exposure to increased estrogen levels might amplify the proliferative impacts on the endometrium, which in turn can contribute to the development of endometrial polyps.

OBESITY AND MALIGNANCY [56,57]

Endometrial polyps are more likely to become cancer if the patient is overweight. Obesity increases the likelihood of endometrial cancer and hyperplasia of the endometrium, two diseases that have many symptoms with endometrial polyps; hence, the connection between the two is clear. Nearly 40% of endometrial cancer patients are

obese, demonstrating the significant impact that weight has on the progression of this malignancy.

Obesity and hyperplasia of the endometrium are strongly correlated, according to the research. Among women diagnosed with complicated hyperplasia, 86% were overweight, according to one research. Hyperplasia is associated with endometrial thickness, which is predicted by body mass index (BMI). It seems that a greater body mass index is associated with thicker endometrial linings, which in turn increases the risk of hyperplastic and perhaps cancerous endometrial changes.

The risk of hyperplasia of the endometrium and cancer is significantly increased in obese women, according to a comprehensive study of premenopausal women. The risk increases with increasing body mass index (BMI). For women whose body mass index (BMI) is 25 or more, the risk of endometrial cancer is about four times higher, and for those whose BMI is 40 or above, it is over twenty times higher. Obesity significantly increases the risk of endometrial cancer, as this sharp rise demonstrates.

Obese women may greatly lower their risk of endometrial cancer with bariatric surgery. Those who choose to have bariatric surgery were less likely to develop endometrial cancer as compared to those who did not. Furthermore, a new prospective cohort research shown that bariatric surgery may correct atypical hyperplasia, a precancerous disease, in women with a body mass index (BMI) of 40 kg/m^2 or above. The results show that bariatric surgery may reduce weight and treat hyperplastic alterations in the endometrium, reducing the risk of cancer.

OBESITY AND OVULATORY DYSFUNCTION [58,59]

Extensive research has demonstrated a strong link between obesity and ovulatory dysfunction, often presenting as irregular menstrual cycles. Over three decades ago, a significant study of 26,638 women aged 20 to 40 revealed a notable correlation between obesity, menstrual irregularity, and anovulation. Women with anovulatory cycles, characterized by irregular cycles lasting longer than 36 days, were, on average, 13.6 kg heavier than those with regular cycles, even after adjusting for age and height.

These results are still supported by current research. Women in the "United States who had a body mass index (BMI) of 35 kg/m² or above were far more likely to have menstrual periods that were longer than average, according to a cross-sectional research of 3,941 women. Obese women had a cycle that was at least twice as likely to be irregular, defined as a fluctuation of 15 days or more between the longest and shortest periods in the past year, according to a study of 726 Australian women aged 26-36 who were not using hormonal contraceptives, were not pregnant, and were not breastfeeding, found that obese women were at least twice as likely to have irregular cycles, defined as a variation of 15 days or more between the longest and shortest cycles in the past year.

Across different ethnic groupings, these connections hold. An increased risk of amenorrhea and oligomenorrhea was associated with rising weight, according to research including 322 Samoan women and 120 Mexican women. Similarly, a study of 4,788 Korean women indicated that menstruation abnormalities were more common in overweight and obese women compared to normal-weight women.

Metrics for central obesity, such as waist circumference, waist-to-hip ratio, or trunk fat, corroborate the association between obesity and monthly irregularity, as does body mass index (BMI)". It is worth mentioning that infertile women may regain regular menstrual cycles after losing weight, suggesting that managing weight might potentially reverse this dysfunction.

The correlation between obesity and menstruation abnormalities is also affected by the degrees of obesity in the past and present. After controlling for other variables, the 1958 British birth cohort study nevertheless found that being overweight as a young adult (at age 23) or childhood (at age 7) increased the likelihood of menstruation issues by age 33. The research included 5,799 females. Women who are overweight are far more likely to have ovulatory dysfunction, according to the available research.

OBESITY AND ENDOMETRIUM [60,61]

The link between obesity and endometrial function, particularly regarding heavy menstrual bleeding, is complex and clinically significant. HMB, which involves excessive menstrual blood loss, presents substantial challenges to women's quality of life and healthcare systems. Again , the low income status, the high incidence in premenopausal women and excluding the BMI implies the severity of the situation and the role that should be played by the society in ensuring that those affected receive the necessary support for the management of the condition.

Obesity that has close relation to hormonal changes affects endometrium through several processes. First link is related to the earlier start of menarche as well as change in menstrual patterns in adolescent girls who have higher BMI. This relationship shows

the overall interaction between fat compartments and hormonal control, which impacts the endometrium's proliferation rate.

Obesity is characterized by elevated BMI, which results in increased production and release of estrogen, mainly associated with aromatase enzymes existing in the adipose tissue that convert androgen into estrogen. HMB may be worsened because estrogen increases the number of endometrial cells. Also, adipokines secreted by adipose tissue led to the angiogenesis and cell growth in the endometrial layer, which can cause disorders of the menstrual cycle.

Thus, the connection between obesity and HMB is highlighted further by the link to endometrial hyperplasia and carcinoma. As the above mentioned secondary conditions are more prevalent in obese women, there is correlation between BMI and amount of menstrual blood loss . Retrospective studies have indicated that HMB occurred more frequently among the overweight female population and more research should be conducted with regards to the link between the two.

Interactive management of HMB in obese people offers certain difficulties. There are changes in the effectiveness of hormonal contraception depending on the degree of obesity; that is, obese women may experience a change in treatment responses. Some surgery, including hysterectomy and endometrial ablation, can also be associated with other risks with obesity of higher BMI. While some findings have dwelled on the issues of using Endometrial ablation in obese women, recent research findings show that the treatment results differ significantly between the obese and non-obese patients.

As such, some management treatments like the levonorgestrel-releasing intrauterine system (LNG-IUS) provide a line of hope in overall handling of HMB among obese persons. Given the high acceptance rate of LNG-IUS in adolescent women who are to undergo bariatric surgery, LNG-IUS could be considered as a first-line therapy for gynecologic complaints.

OBESITY AND POLYSCYSTIC OVARY [62,63]

The effects of PCOS and obesity are significant specifically towards women's reproductive health and especially concerning the menstrual irregularities such as abnormal uterine bleeding. PCOS, which features ovulatory dysfunction and hyperandrogenism, is frequently associated with obesity. This combination exacerbates symptoms and complicates the clinical picture.

Obesity's effect on the endometrium and the formation of polyps and hyperplasia have correlations with the ovulatory dysfunction inherently associated with PCOS and fat related distorted menstrual cycle. Due to lack of ovulation, there is hyperestrogenic condition in PCOS patients which leads to hyperplasia of the endometrium and a possible rise in endometrial cancer. Research shows that hyperplasia and an increase in the level of endometrial thickness is quite common in anovulatory women with PCOS, highlighting the elevated risk that is caused by ovulatory disorders.

Further, AUB in women with PCOS remains a clinical challenge due to the association of the latter with endometrial polyps. The high prevalence of menstrual dysfunction in PCOS, estimated at 75% to 85%, places a considerable burden on

healthcare systems due to the costs associated with hormonal treatments for AUB in PCOS patients.

Obesity complicates the clinical manifestation of PCOS further. Many women with PCOS are overweight or obese, making it difficult to distinguish the effects of PCOS from those of obesity on menstrual dysfunction. Studies show a rising prevalence of PCOS with increasing obesity rates, emphasizing the significant role of weight in the severity and expression of PCOS symptoms.

Obesity worsens PCOS-related hyperandrogenism and menstrual disturbances, leading to a higher prevalence of menstrual abnormalities in obese women with PCOS compared to those who are not obese. Weight gain often precedes the onset of menstrual issues in PCOS, underscoring the reciprocal relationship between obesity and PCOS-related AUB.

Encouragingly, weight loss interventions have been shown to improve menstrual function in women with PCOS. Studies have demonstrated that weight reduction can lead to improvements in menstrual function in adolescents, infertile women, and adults with PCOS, highlighting the critical role of weight management in alleviating the severity of PCOS-related AUB.

OBESITY IN THE ABSENCE OF POLYCYSTIC OVARY [64,65]

Obesity, even without the presence of polycystic ovary syndrome, significantly impacts menstrual function, fertility, and overall reproductive health. While obesity has been attributed to menstrual problems in obese women, obesity can in its right affect the hypothalamic-pituitary-ovarian axis resulting in cycle irregularities.

Some of the complications of obesity include insulin resistance, hormonal changes, hyperandrogenism, hirsutism and infertility. They can also affect the ovaries and disrupt the menstrual cycle not necessarily due to PCOS. Data shows that dieting, and metformin therapy for example, can help with the menstrual abnormalities in obese women who do not have PCOS, further proving that obesity-related menstrual problems can be treated.

Moreover, obesity is also known to impact the endometrial thickness and the blood flow in the uterus independently. Hyperinsulinaemia resulting from obesity is linked to increased endometrial thickness and obesity measures are directly related to endometrial thicknesss and even among women who do not have PCOS. Obesity has also been shown to have a "direct effect on uterine blood flow as measured by Doppler uterine artery pulsatility index, hence its direct effects on uterine vascularization and function".

Studies among fertile women attending antenatal metabolic clinics have shown that severe obesity does not significantly affect menstrual cycle regularity in this group. Despite obese women experiencing an "earlier age at menarche compared to their normal-weight counterparts, there were no significant differences in menstrual cycle

regularity or length between the two groups". These findings highlight that some women may be less affected by obesity's impact on menstrual function, underscoring the complexity of individual variability in response to hormonal changes related to obesity.

REVIEW OF PREVIOUS STUDIES

1. 1. A study by Teitelman M et al.[66] surveyed 410 women from the "Hospital of the University of Pennsylvania" bariatric surgery database who were under the age of 40. They reached 51.2% of their target population by sending out surveys to 195 women, who then filled them out. Abnormal menstrual periods were defined as those lasting more than 35 days, according to the women who reported them. Based on their menstrual history before to surgery, 92 out of 195 participants were determined to be anovulatory. Time since surgery was a major differentiator between the groups, although postoperative body mass index (BMI), BMI reduction, or age at surgery were not. The BMI dropped by more than 18 kg/m² in both groups. Ovulatory women had an average menstrual cycle length of 27.3 days before surgery, whereas anovulatory women had an average cycle length of 127.5 days. Seventy-one percent of women who were anovulatory before surgery saw a return to regular menstrual cycles after the procedure, and those who were able to ovulate again lost more weight than those who did not. This provides further evidence that bariatric surgery may alleviate anovulation and menstrual problems, which are prevalent in very obese women before menopause. Therefore, infertility caused by anovulation may be another reason to consider bariatric surgery.

2. Twenty consecutive women who had been diagnosed with dysfunctional uterine bleeding (DUB) were investigated at a referral endocrinology clinic in Shahrood city, Semnan, as part of an observational case series that was conducted by Nouri M et al[67]. In the research, obesity was evaluated using body mass index

(BMI) and waist circumference. The average waist circumference was roughly 103 centimeters, and the average body mass index was approximately 32.6 kilograms per square meter. One-third of the women were obese, while the other two-thirds were on the overweight side. Based on the findings of the research, which indicated that there is a significant connection between obesity and DUB, it is recommended that weight loss be looked at as a conservative treatment option in addition to other medicinal or surgical treatments.

3. Wise MR et al[68] carried out a retrospective cohort analysis at a major metropolitan women's health care. The study included 916 premenopausal women who had abnormal uterine bleeding and had undergone endometrial biopsy between the years 2008 and 2014. Endometrial cancer and complicated endometrial hyperplasia, with or without atypia, were the major endpoints of the study. Nearly five percent of the patients were diagnosed with malignancy or complicated endometrial hyperplasia. When clinical and demographic characteristics were taken into account, it was shown that women with a body mass index (BMI) of 30 kg/m2 or greater had a nearly fourfold increased risk of developing complicated hyperplasia or cancer. Nulliparity and anemia were two additional risk variables that were shown to be significant, but age, diabetes, and menstruation history were not found to be major risk factors.
4. Pennant ME et al[69] conducted a search in PubMed, Embase, and the Cochrane Library for papers that reported the "prevalence of endometrial cancer and/or atypical hyperplasia in women who had irregular uterine bleeding before to menopause". During the course of their investigation, they looked at 65 different papers and came to the conclusion that the risk of cancer of the endometrium was 0.33%, while the total risk of endometrial cancer and atypical

hyperplasia was 1.31%. those who had excessive menstrual bleeding had a decreased chance of developing endometrial cancer in comparison to those who experienced hemorrhaging between menstrual periods. In premenopausal women who have abnormal uterine bleeding, the authors came to the conclusion that the risk of endometrial cancer or atypical hyperplasia is minimal. This finding suggests that traditional medical therapy should be the first therapeutic option.

5. Sharma AS et al[70] conducted a study on 32 women who had been diagnosed with irregular uterine hemorrhage. Significant organic and systemic reasons were ruled out in the study. They determined the body mass index (BMI) for each individual with a mean BMI of 27.92 kg/m2, with 81% of patients having a BMI that was higher than the normal range. Both the mean age and the mean duration of AUB were 37.65 years, with the mean duration being 2.71 years. According to the findings of the research, there is a clear connection between having a high body mass index (BMI) and having an AUB, which highlights the need of reducing one's weight as a preventative strategy and as a component of conservative therapy.

6. Ganesan DK et al[71] conducted a cross-sectional study in a rural health and training center involving 163 women of reproductive age. They found a significant association between BMI and irregular menstrual patterns. The mean age of participants was 31.29 years, and the mean age at menarche was 12.59 years. The majority of participants belonged to the lower middle class, were married, homemakers, and had high school-level education. ust 44 percent of the respondents had normal BMI while 8 percent belonged to the obesity

classification. Abnormal menstrual cycles were found in 13% of the women, stressing the need to address aspects that could lead to weight gain and restore healthy reproductive years.

7. vanovic R et al[72] performed a cross-sectional research on 45 women, hospitalized to the gynecology ward at the "University Hospital in Foča" regarding AUB, and 45 women who were examined for gynecology but did not have AUB. On the other hand, other relevant risk factors that were identified to be associated with functional AUB in perimenopausal women include hypertension, alcohol and cigarette consumption, high BMI and increasing maternal age. Thus, studies indicate that gynecologists ought to emphasize the risks associated with drinking and smoking and also highlight the importance of as well as managing weight and blood pressure.

8. A cross-sectional study was carried out at the Kunming Tongren Hospital and enrolled 120 perimenopausal women with AUB (Tian Y et al[73]., 2017). They were able to determine the variables that had prospects to AUB with the aid of univariate and multivariate logistic regression models. The common predictors that were found to have a relationship with AUB include age of the woman, her BMI, gestational age, and the insertion of an intrauterine device. The study wants early detection of these risk factors as it established that AUB during the menopausal transition is associated with several.
9. The case-control study by Akalyaa K et al[74] involved 100 women with AUB from the ESIC-PGIMSR Bangalore. Each subject's period patterns and endometrial histology were evaluated according to the BMI groups of the subjects. For premenopausal AUB patients, the study identified that for each

unit increment in BMI, the likelihood of developing endometrial hyperplasia with atypia, which is a precancerous state, was substantially enhanced. In preventing endometrial hyperplasia and cancer, the research focuses on the necessity of controlling BMI level.

MATERIALS & METHODS

MATERIALS & METHODS

Study Area

Department of Obstetrics and Gynaecology, Sri Devaraj Urs Medical College, Tamaka, Kolar.

Study Population

Perimenopausal women who are diagnosed with abnormal uterine bleeding who presented to the department of Obstetrics and Gynaecology, R.L. Jalappa Hospital and Research Centre, Kolar, during the proposed study period.

Study Design

Comparative Study

Sample Size

The sample size was calculated using the findings from an analytical case control research done by Akalyaa K et al[74]. Accordingly, the mean endometrial thickness of the subjects, were observed to be 17.06 ± 5.91 mm in Group with overweight & obese women (Cases), and 15.80 ± 4.30 mm in Group with normal BMI (Controls). The following formula was used to compute the sample size, taking into account a 95.0% confidence interval and an 80% power:;

$$n = \frac{\left(Z_{1-\alpha} + Z_{1-\beta}\right)^2 \left[{\sigma_1}^2 + {\sigma_2}^2/r\right]}{(\mu_1 - \mu_2)^2}$$

Here;

$Z = 1.96$, $\alpha = 0.05$ and $\beta = 0.2$

$\mu 1 = 17.06$ and $\sigma 1 = 5.91$

$\mu 2 = 15.80$ and $\sigma 2 = 4.30$

$r = 1$

The sample size (n) was estimated to be 28 in each group, which was rounded to 31 subjects per group, considering 10.0% non-response rate. That makes the total sample size of 62 subjects, which was considered for the study.

Sampling Method

Simple random sampling

Study Duration

September 2022 to December 2023

Inclusion Criteria

- All perimenopausal women presenting to the department of O.B.G., with complaints of abnormal uterine bleeding in the perimenopausal age group (45 to 55 years of age) willing to give written informed consent with BMI of 18.5 to 24.99 (Normal weight) and BMI ≥25 (overweight and obesity)

Exclusion Criteria

- Perimenopausal women with existing cervical, uterine and/or ovarian cancer
- Perimenopausal women with pelvic inflammatory disease
- Perimenopausal women with coagulation disorders

- Perimenopausal women with existing cervical, uterine and/or ovarian cancer
- Perimenopausal women with pelvic inflammatory disease
- Perimenopausal women with coagulation disorders
- Perimenopausal women with on-going pregnancy
- Perimenopausal women with thyroid disorders
- Perimenopausal women with liver disorders
- Perimenopausal women with chronic kidney disease
- Refusal of consent

Methodology

Perimenopausal women who are diagnosed with abnormal uterine bleeding who presented to the department of O.B.G., SDUMC, Kolar, during the proposed study period, and were eligible for the study according to the above-mentioned eligibility criteria were included in the study after obtaining informed consent from the patient.

The age, parity, personal and family history of cancer, and duration of symptoms were recorded for each patient at admission, along with any prior malignancies. The following symptoms were noted: overall malaise, extreme tiredness, gastrointestinal and urinary issues, edema, discomfort, pain, and mass in the abdomen.

A thorough physical examination was performed on each patient, checking the patient's “breasts, lymph nodes, abdomen, and pelvis. Their body mass index (BMI), weight, and height were also recorded. Initial testing included taking a thorough medical history and doing a battery of diagnostic tests, including a full blood count, liver and renal function tests, coagulation profile, and pelvic ultrasound. Endometrial

samples were taken from both the experimental and control groups by means of dilatation and curettage (D&C) or Pipelle biopsy, and endometrial patterns were examined in the histopathological report".

"BMI was calculated by;

Quetelet index = Weight (in kg) / Height (in m^2)

BMI categories

- Underweight ≤18.5
- Normal weight = 18.5 to 24.9
- Overweight = 25.0 to 29.9
- Obesity = BMI of 30 or greater

The patients were divided into cases and control groups;

- **Cases**

  BMI ≥25 (overweight and obesity)

- **Controls**

  BMI of 18.5 to 24.99 (Normal weight)

The following comparisons were considered;

- "Comparison of disturbance in regularity of menstrual bleeding among both the groups

- Comparison of menstrual flow among both the groups

- Comparison of endometrial thickness in both the groups"

- Comparison of histopathological findings and different patterns in both the groups such as;
    - Secretory
    - Proliferative
    - Biphasic
    - Disordered Proliferative
    - Simple hyperplasia without atypia
    - Simple hyperplasia with atypia
    - Complex hyperplasia without atypia
    - Complex hyperplasia with atypia
    - Endometrial carcinoma

- "Comparison of endometrial hyperplasia among the study groups

- Comparison of mean endometrial thickness and body mass index among the study groups

- Finally, comparison of mean endometrial thickness and mean body index among the study groups"

Statistical analysis

We used SPSS version 26 to evaluate the data that was input into Microsoft Excel. The chi-square test was used to determine the significance of qualitative data, while categorical data was provided as proportions and frequencies. If the 2x2 tables did not satisfy the Chi-square requirements, Fischer's exact test was used, and if Yates correction was required, it was implemented. Mean and standard deviation were used to display continuous data, which were tested for normality using the Shapiro-Wilk and Kolmogorov-Smirnov tests. Mean differences between two quantitative variables were found using the independent t-test, whereas median differences in skewed distributions were addressed using the Mann-Whitney U test. We used Microsoft Word and Excel to make bar and pie charts and other graphs. For statistical purposes, a p-value below 0.05 was deemed significant. We analyzed the data with the help of Microsoft Excel and IBM SPSS Statistics, Somers, NY, USA, version 22.

RESULTS

RESULTS

Table 1: Comparison of age distribution between cases and controls

Subjects (N=62)	Group		Total	p-value#
	Cases (N=31)	Controls (N=31)		
Mean	49.65 years	49.94 years	49.79 years	0.623
SD	2.17 years	2.45 years	2.30 years	
Minimum	44.00 years	43.00 years	43.00 years	
Median	50.00 years	50.00 years	50.00 years	
Maximum	54.00 years	55.00 years	55.00 years	

Independent t-test

The comparison of age distribution between the cases and controls shows a mean age of 49.65 ± 2.17 years for the cases and 49.94 ± 2.45 years for the controls, with no significant difference (p = 0.623). The age range for both groups is similar, with a median age of 50 years, indicating that both groups are well-matched in terms of age.

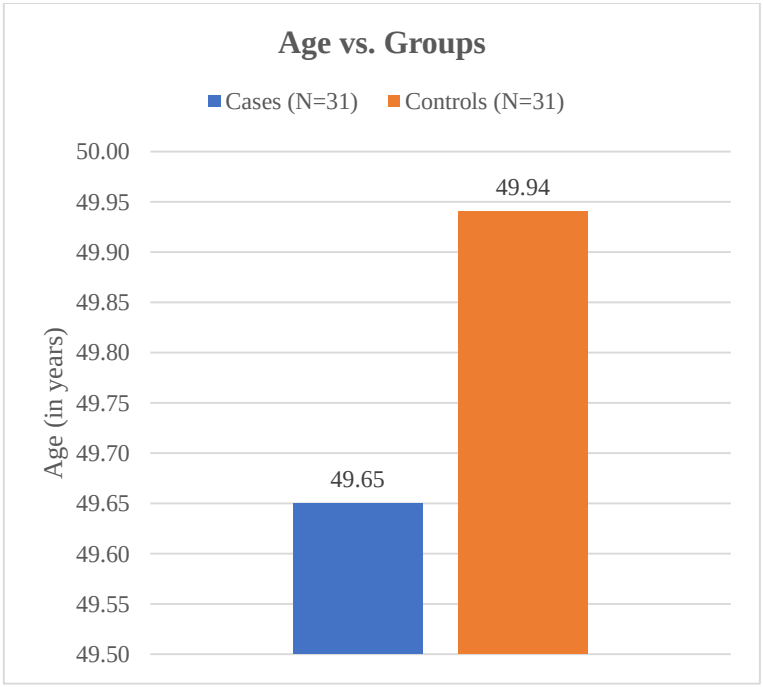

Figure 4: Comparison of age distribution between cases and controls

Table 2: Comparison of height distribution between cases and controls

Subjects (N=62)	Group		Total	p-value#
	Cases (N=31)	Controls (N=31)		
Mean	158.98 cm	158.04 cm	158.51 cm	0.511
SD	6.05 cm	5.07 cm	5.55 cm	
Minimum	151.02 cm	150.09 cm	150.09 cm	
Median	158.00 cm	158.49 cm	158.24 cm	
Maximum	169.20 cm	168.11 cm	169.20 cm	

Independent t-test

Height distribution comparison shows a mean height of 158.98 ± 6.05 cm for the cases and 158.04 ± 5.07 cm for the controls. The p-value of 0.511 indicates no significant difference between the groups. Both groups have a similar height range and median, suggesting comparable physical characteristics.

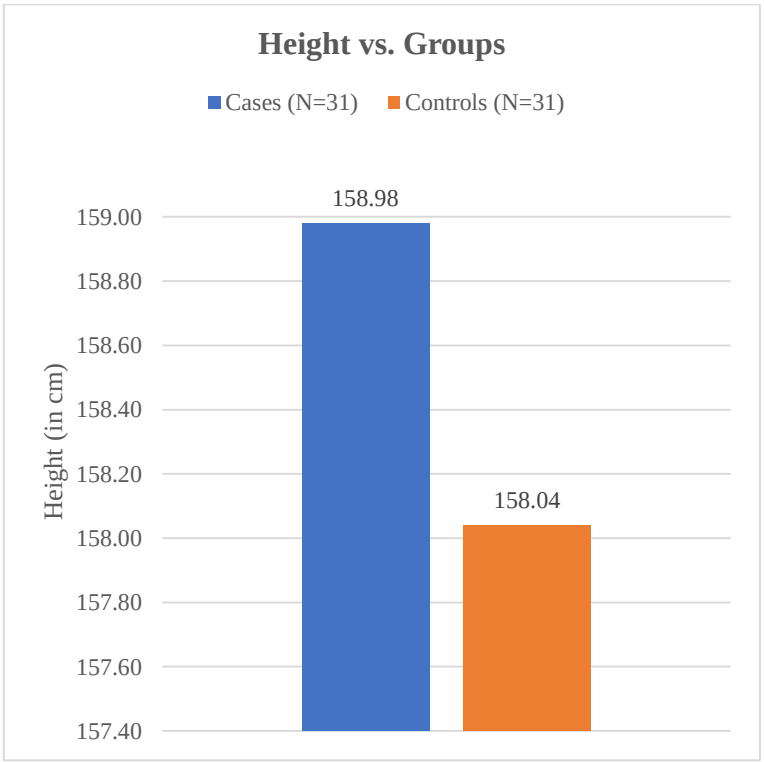

Figure 5: Comparison of height distribution between cases and controls

Table 3: Comparison of weight distribution between cases and controls

Subjects (N=62)	Group		Total	p-value#
	Cases (N=31)	Controls (N=31)		
Mean	80.67 kg	54.75 kg	67.71 kg	<0.001*
SD	11.56 kg	5.22 kg	15.81 kg	
Minimum	61.24 kg	45.91 kg	45.91 kg	
Median	77.94 kg	53.88 kg	62.13 kg	
Maximum	102.99 kg	69.80 kg	102.99 kg	

Independent t-test
* Statistically significant

The mean weight of the cases is 80.67 ± 11.56 kg, significantly higher than the 54.75 ± 5.22 kg mean weight of the controls ($p < 0.001$). This substantial difference highlights the weight disparity between the two groups, which could influence the study outcomes.

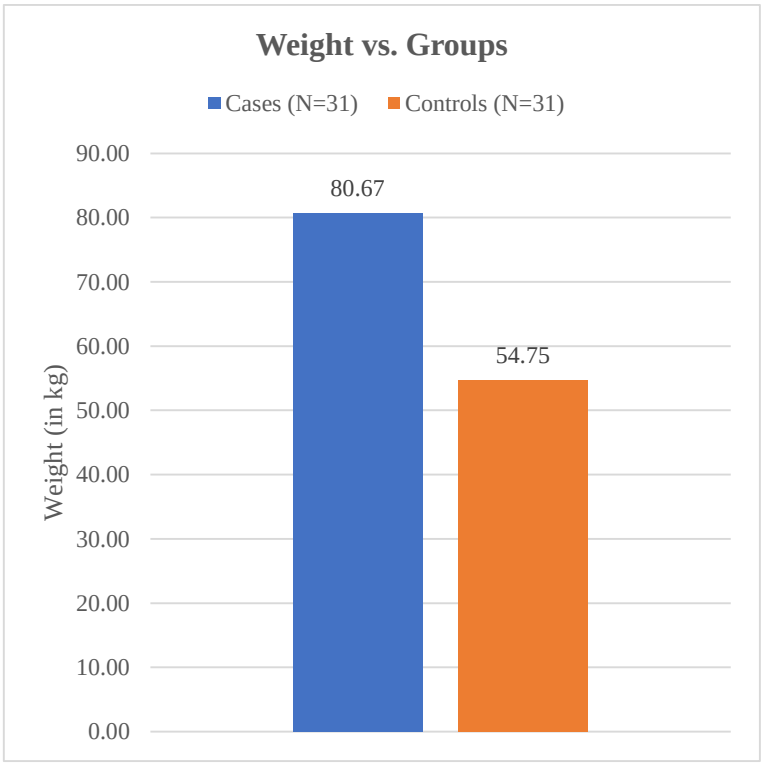

Figure 6: Comparison of weight distribution between cases and controls

Table 4: Comparison of BMI distribution between cases and controls

Subjects (N=62)	Group		Total	p-value#
	Cases (N=31)	Controls (N=31)		
Mean	31.85 kg/m^2	21.91 kg/m^2	26.88 kg/m^2	<0.001*
SD	3.71 kg/m^2	1.67 kg/m^2	5.77 kg/m^2	
Minimum	26.50 kg/m^2	19.00 kg/m^2	19.00 kg/m^2	
Median	31.50 kg/m^2	21.70 kg/m^2	25.70 kg/m^2	
Maximum	38.40 kg/m^2	24.90 kg/m^2	38.40 kg/m^2	

Independent t-test
* Statistically significant

BMI comparison reveals a significantly higher mean BMI in the cases (31.85 ± 3.71 kg/m^2) compared to the controls (21.91 ± 1.67 kg/m^2), with a p-value of <0.001. This indicates a clear distinction in BMI between the groups, with cases being classified as overweight or obese.

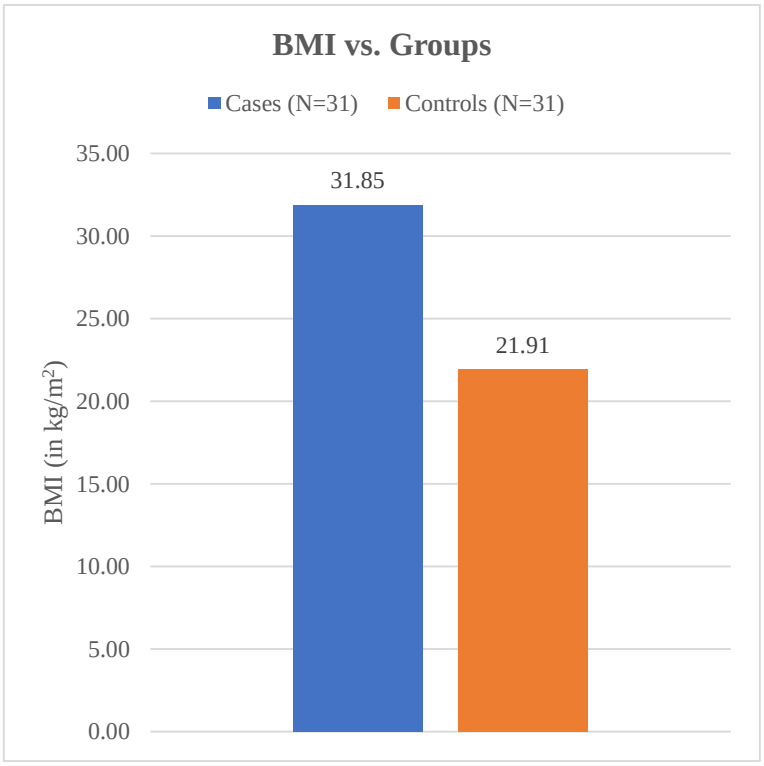

Figure 7: Comparison of BMI distribution between cases and controls

Table 5: Comparison of age at menarche between cases and controls

Subjects (N=62)	Group		Total	p-value#
	Cases (N=31)	Controls (N=31)		
Mean	12.77 years	13.61 years	13.19 years	0.010*
SD	1.31 years	1.17 years	1.30 years	
Minimum	11.00 years	11.00 years	11.00 years	
Median	13.00 years	14.00 years	13.00 years	
Maximum	15.00 years	15.00 years	15.00 years	

Independent t-test
* Statistically significant

The mean age at menarche for the cases is 12.77 ± 1.31 years, which is significantly lower than the 13.61 ± 1.17 years for the controls (p = 0.010). This suggests an earlier onset of menarche in the cases, which may be relevant to the study's focus on abnormal uterine bleeding.

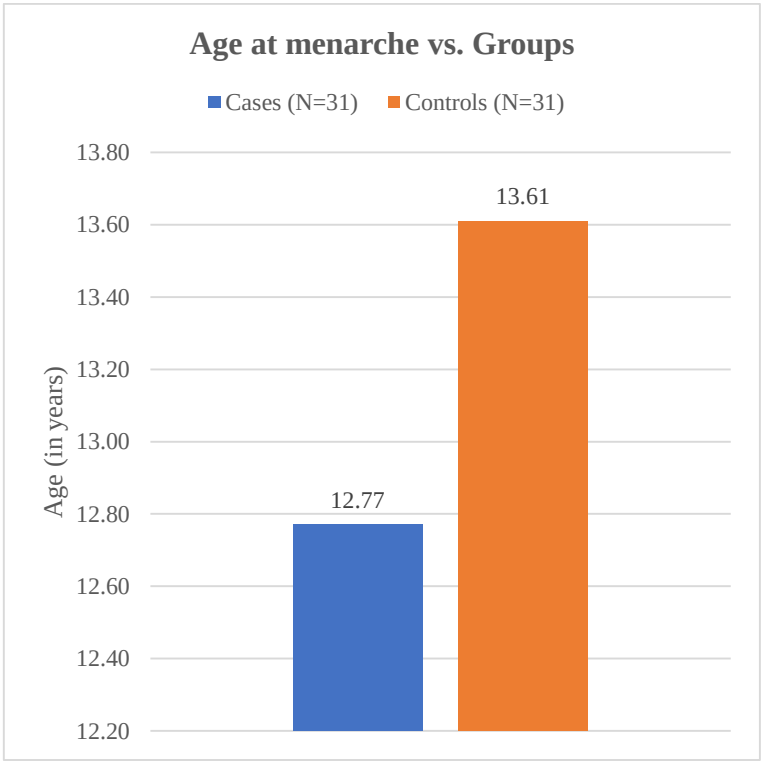

Figure 8: Comparison of age at menarche between cases and controls

Table 6: Comparison of parameters of menstrual cycle between cases and controls

Subjects (N=62)		Group				Total		p-value#
		Cases (N=31)		Controls (N=31)				
		N	%	N	%	N	%	
Frequency	Normal	5	16.1%	13	41.9%	18	29.0%	0.019*
	Infrequent	9	29.0%	11	35.5%	20	32.3%	
	Frequent	17	54.8%	7	22.6%	24	38.7%	
Regularity	Regular	4	12.9%	11	35.5%	15	24.2%	0.053
	Irregular	17	54.8%	16	51.6%	33	53.2%	
	Prolonged	10	32.3%	4	12.9%	14	22.6%	
Duration	Normal	6	19.4%	15	48.4%	21	33.9%	0.037*
	Shortened	9	29.0%	8	25.8%	17	27.4%	
	Prolonged	16	51.6%	8	25.8%	24	38.7%	
Volume	Normal	6	19.4%	14	45.2%	20	32.3%	0.011*
	Light	8	25.8%	11	35.5%	19	30.6%	
	Heavy	17	54.8%	6	19.4%	23	37.1%	
Dysmenorrhea	Yes	21	67.7%	13	41.9%	34	54.8%	0.041*
	No	10	32.3%	18	58.1%	28	45.2%	
Associated clots	Yes	18	58.1%	14	45.2%	32	51.6%	0.309
	No	13	41.9%	17	54.8%	30	48.4%	

Chi-square test
* Statistically significant

The comparison of menstrual cycle parameters between cases and controls shows significant differences in frequency, duration, volume, and dysmenorrhea. Cases had more frequent (54.8%) and prolonged (51.6%) cycles, heavier bleeding (54.8%), and higher dysmenorrhea incidence (67.7%) compared to controls. These findings indicate a more severe disruption of menstrual patterns among the cases.

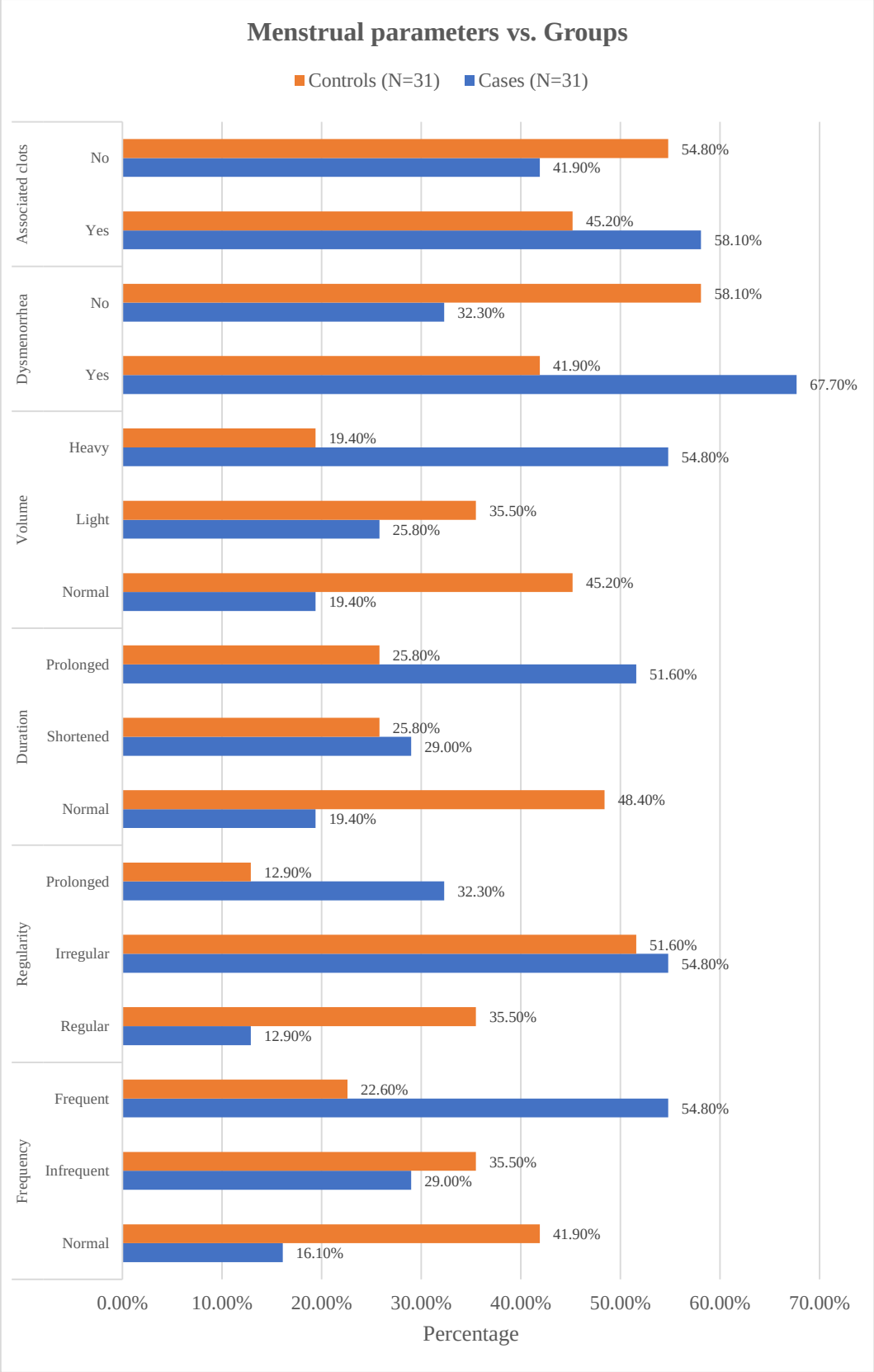

Figure 9: Comparison of parameters of menstrual cycle between cases and controls

Table 7: Comparison of other symptoms between cases and controls

Subjects (N=62)		Group				Total		p-value#
		Cases (N=31)		Controls (N=31)				
		N	%	N	%	N	%	
Abdominal pain	**Yes**	19	61.3%	10	32.3%	29	46.8%	0.022*
	No	12	38.7%	21	67.7%	33	53.2%	
Urinary symptoms	**Yes**	11	35.5%	7	22.6%	18	29.0%	0.263
	No	20	64.5%	24	77.4%	44	71.0%	
White discharge	**Yes**	20	64.5%	8	25.8%	28	45.2%	0.002*
	No	11	35.5%	23	74.2%	34	54.8%	

Chi-square test
* Statistically significant

The comparison of other symptoms reveals that cases had significantly higher occurrences of abdominal pain (61.3%) and white discharge (64.5%) compared to controls (32.3% and 25.8%, respectively), with p-values of 0.022 and 0.002, respectively. Urinary symptoms were not significantly different between the groups.

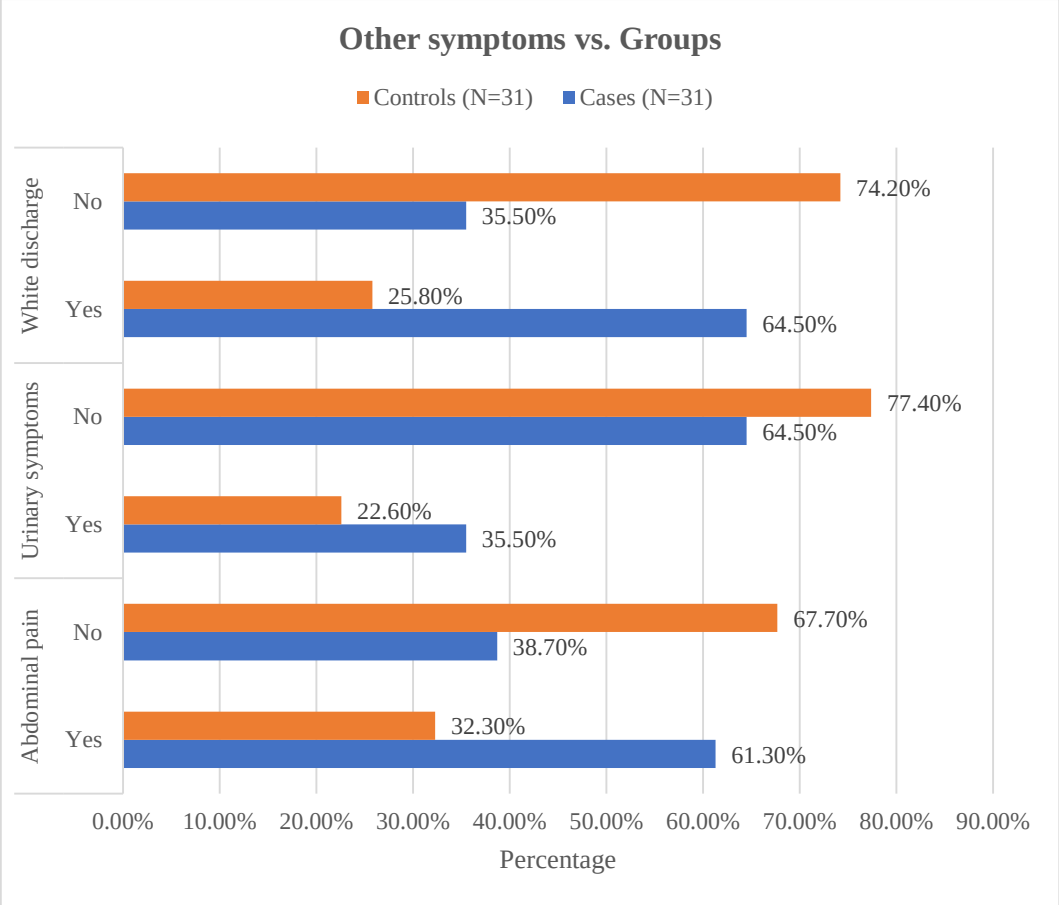

Figure 10: Comparison of other symptoms between cases and controls

Table 8: Comparison of past and personal history between cases and controls

Subjects (N=62)		Group				Total		p-value[#]
		Cases (N=31)		Controls (N=31)				
		N	%	N	%	N	%	
Diabetes Mellitus	**Yes**	15	48.4%	7	22.6%	22	35.5%	0.034*
	No	16	51.6%	24	77.4%	40	64.5%	
Hypertension	**Yes**	10	32.3%	6	19.4%	16	25.8%	0.246
	No	21	67.7%	25	80.6%	46	74.2%	
Hypothyroidism	**Yes**	13	41.9%	3	9.7%	16	25.8%	0.004*
	No	18	58.1%	28	90.3%	46	74.2%	
OC Pills	**Yes**	13	41.9%	4	12.9%	17	27.4%	0.010*
	No	18	58.1%	27	87.1%	45	72.6%	
Diet	**Vegetarian**	13	41.9%	21	67.7%	34	54.8%	0.041*
	Mixed	18	58.1%	10	32.3%	28	45.2%	

Chi-square test
* Statistically significant

Comparing past and personal history, the cases had significantly higher incidences of diabetes mellitus (48.4%), hypothyroidism (41.9%), OC pill usage (41.9%), and a mixed diet (58.1%) compared to controls, with respective p-values of 0.034, 0.004, 0.010, and 0.041. This suggests a more complex health profile for the cases.

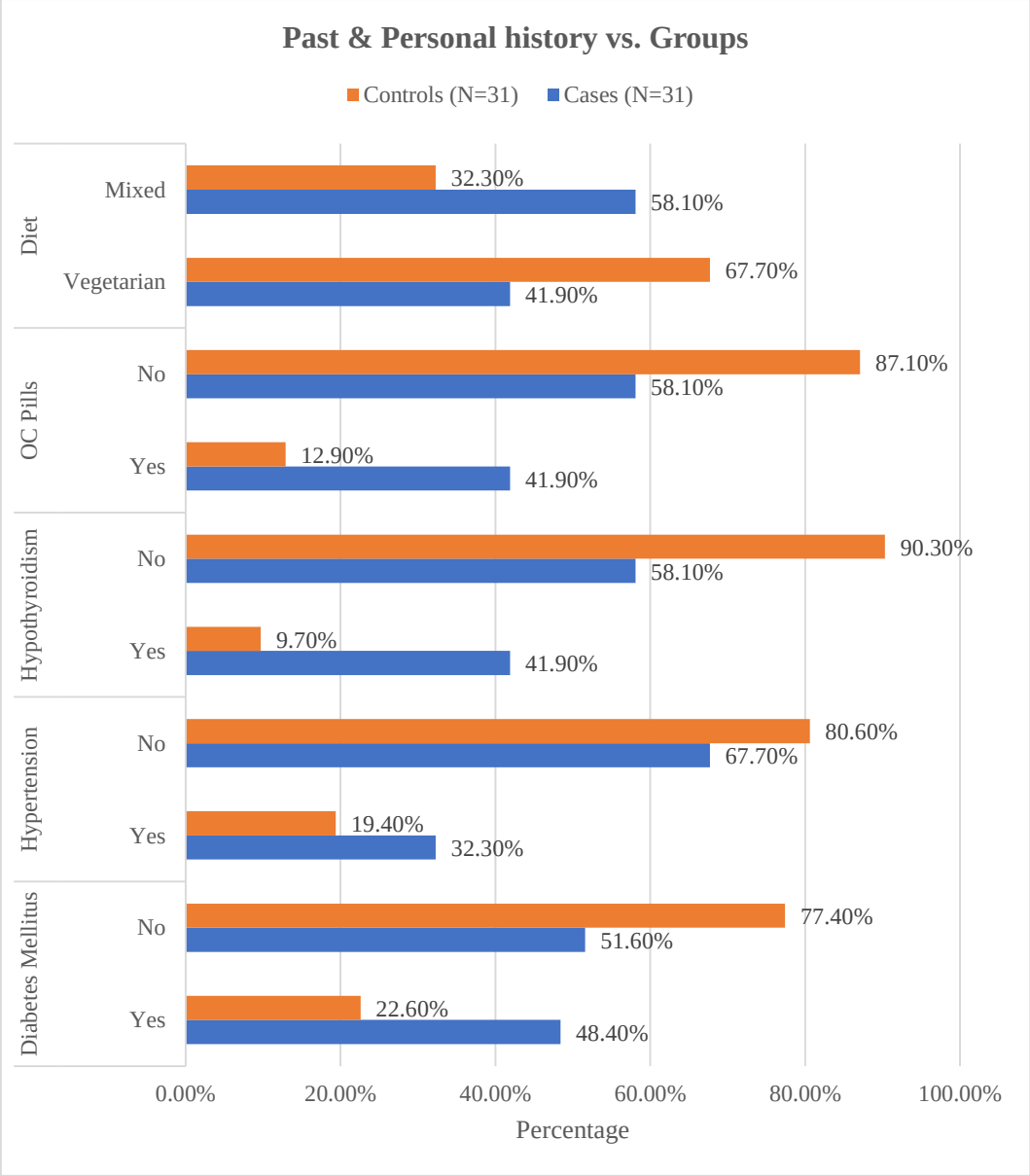

Figure 11: Comparison of past and personal history between cases and controls

Table 9: Comparison of biopsy findings between cases and controls

Subjects (N=62)		Group				Total		p-value[#]
		Cases (N=31)		Controls (N=31)				
		N	%	N	%	N	%	
Secretory phase	**Yes**	12	38.7%	14	45.2%	26	41.9%	0.607
	No	19	61.3%	17	54.8%	36	58.1%	
Proliferative phase	**Yes**	2	6.5%	14	45.2%	16	25.8%	<0.001*
	No	29	93.5%	17	54.8%	46	74.2%	
Biphasic	**Yes**	5	16.1%	2	6.5%	7	11.3%	0.229
	No	26	83.9%	29	93.5%	55	88.7%	
Disordered proliferative phase	**Yes**	12	38.7%	1	3.2%	13	21.0%	0.001*
	No	19	61.3%	30	96.8%	49	79.0%	
Simple hyperplasia without atypia	**Yes**	6	19.4%	21	67.7%	27	43.5%	<0.001*
	No	25	80.6%	10	32.3%	35	56.5%	
Simple hyperplasia with atypia	**Yes**	5	16.1%	3	9.7%	8	12.9%	0.449
	No	26	83.9%	28	90.3%	54	87.1%	
Complex hyperplasia without atypia	**Yes**	8	25.8%	6	19.4%	14	22.6%	0.544
	No	23	74.2%	25	80.6%	48	77.4%	
Complex hyperplasia with atypia	**Yes**	8	25.8%	1	3.2%	9	14.5%	0.012*
	No	23	74.2%	30	96.8%	53	85.5%	
CA Endometrium	**Yes**	4	12.9%	0	0.0%	4	6.5%	0.039*
	No	27	87.1%	31	100.0%	58	93.5%	

Chi-square test
* Statistically significant

The biopsy findings comparison indicates significant differences in proliferative phase ($p < 0.001$), disordered proliferative phase ($p = 0.001$), simple hyperplasia without atypia ($p < 0.001$), complex hyperplasia with atypia ($p = 0.012$), and endometrial carcinoma ($p = 0.039$) between cases and controls. These results suggest varied endometrial patterns among the groups, with cases showing more complex and disordered patterns.

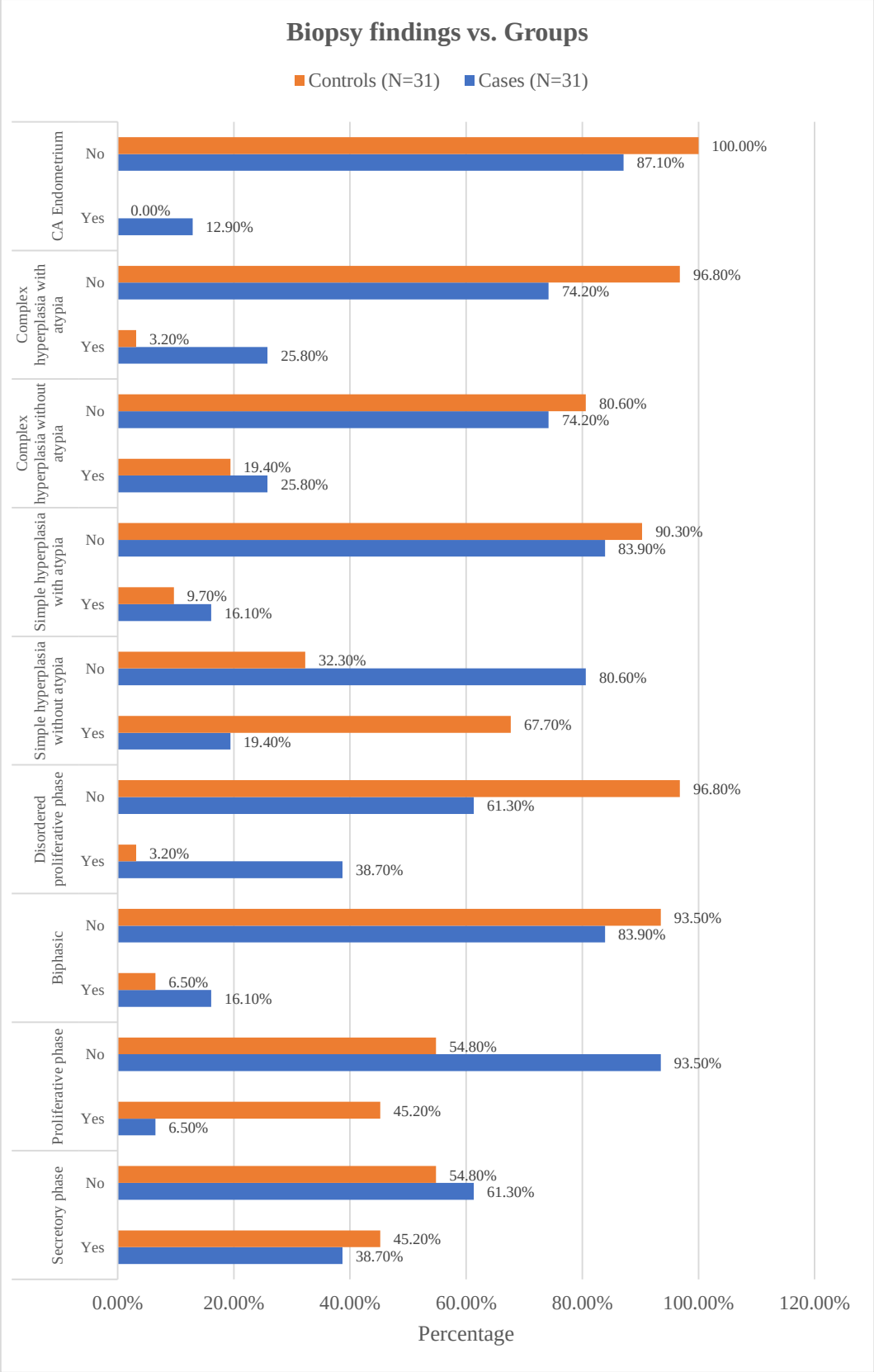

Figure 12: Comparison of biopsy findings between cases and controls

Table 10: Comparison of endometrial thickness between cases and controls

Subjects (N=62)	Group		Total	p-value#
	Cases (N=31)	Controls (N=31)		
Mean	19.71 mm	14.00 mm	16.85 mm	<0.001*
SD	4.53 mm	3.35 mm	4.89 mm	
Minimum	12.00 mm	8.00 mm	8.00 mm	
Median	19.00 mm	14.00 mm	16.00 mm	
Maximum	29.00 mm	21.00 mm	29.00 mm	

Independent t-test
* Statistically significant

Endometrial thickness comparison reveals a significantly higher mean thickness in cases (19.71 ± 4.53 mm) compared to controls (14.00 ± 3.35 mm), with a p-value of <0.001. This suggests that cases have a greater endometrial thickness, which may correlate with their health status and study outcomes.

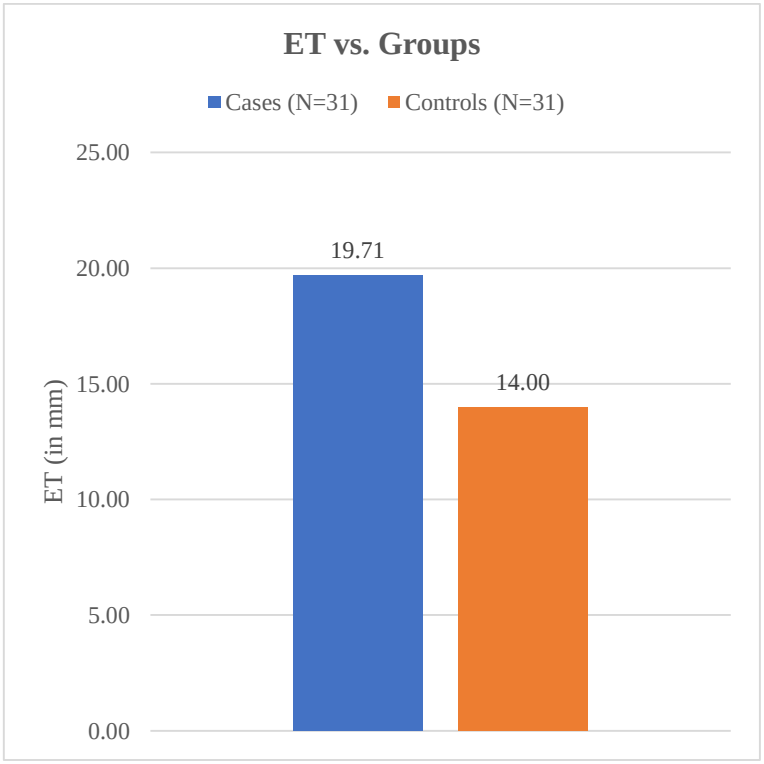

Figure 13: Comparison of endometrial thickness between cases and controls

Table 11: Distribution of cases based on BMI

Controls (N=31)	Frequency (N)	Percentage (%)
Overweight	12	38.7%
Obese	19	61.3%

Among the cases, 38.7% were categorized as overweight, while 61.3% were classified as obese. This distribution indicates a high prevalence of obesity within the control group, which could impact the study's findings related to BMI and health outcomes.

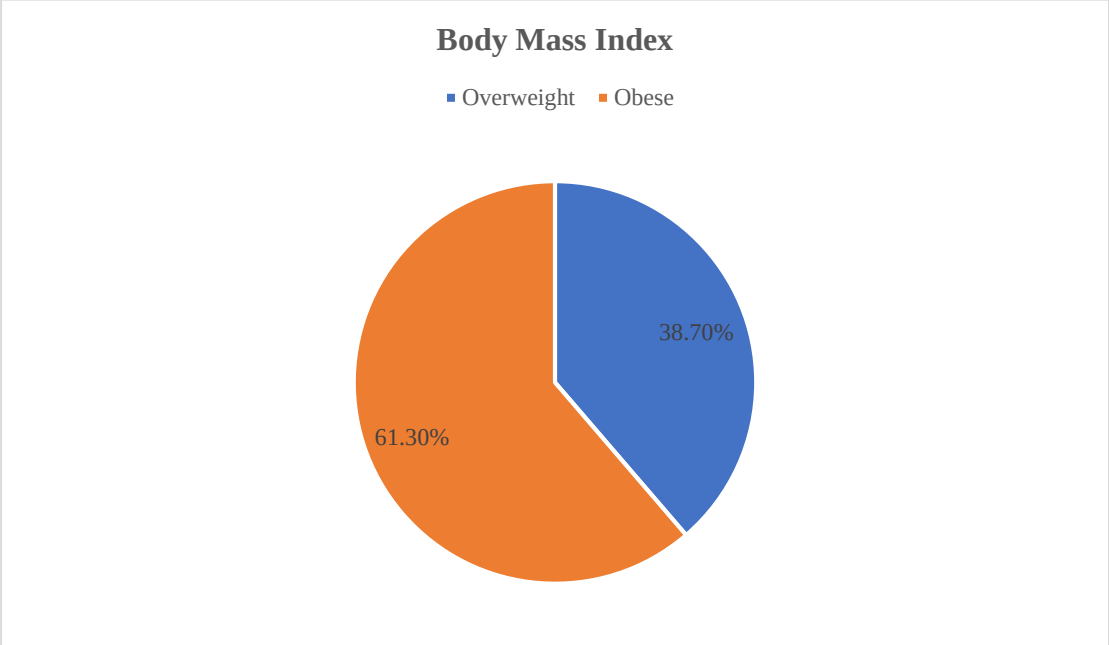

Figure 14: Distribution of cases based on BMI

Table 12: Comparison of parameters of menstrual cycle between overweight and obese individuals in cases

Cases (N=31)		Group				p-value#
		Overweight (N=12)		Obese (N=19)		
		N	%	N	%	
Frequency	Normal	2	16.7%	3	15.8%	0.925
	Infrequent	3	25.0%	6	31.6%	
	Frequent	7	58.3%	10	52.6%	
Regularity	Regular	2	16.7%	2	10.5%	0.749
	Irregular	7	58.3%	10	52.6%	
	Prolonged	3	25.0%	7	36.8%	
Duration	Normal	2	16.7%	4	21.1%	0.901
	Shortened	4	33.3%	5	26.3%	
	Prolonged	6	50.0%	10	52.6%	
Volume	Normal	3	25.0%	3	15.8%	0.814
	Light	3	25.0%	5	26.3%	
	Heavy	6	50.0%	11	57.9%	
Dysmenorrhea	Yes	4	33.3%	6	31.6%	0.919
	No	8	66.7%	13	68.4%	
Associated clots	Yes	4	33.3%	9	47.4%	0.440
	No	8	66.7%	10	52.6%	

Chi-square test

The comparison of menstrual cycle parameters between overweight and obese individuals in the case group shows no significant differences. Both groups had similar distributions in frequency, regularity, duration, volume, dysmenorrhea, and associated clots, indicating that BMI did not significantly affect these menstrual parameters within the controls.

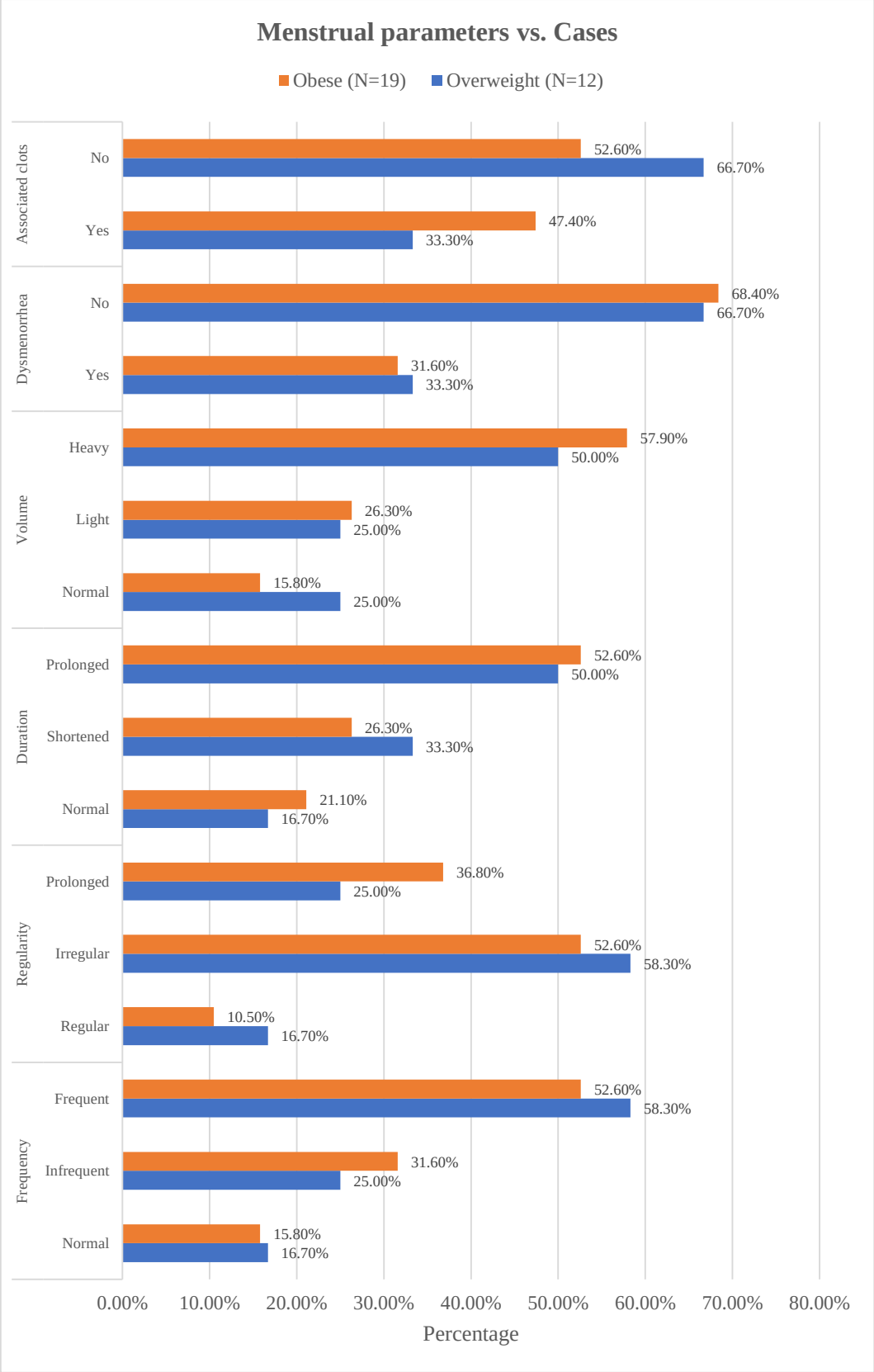

Figure 15: Comparison of parameters of menstrual cycle between overweight and obese individuals in cases

Table 13: Comparison of other symptoms between overweight and obese individuals in cases

Cases (N=31)		Group				p-value#
		Overweight (N=12)		Obese (N=19)		
		N	%	N	%	
Abdominal pain	**Yes**	7	58.3%	12	63.2%	0.788
	No	5	41.7%	7	36.8%	
Urinary symptoms	**Yes**	4	33.3%	7	36.8%	0.842
	No	8	66.7%	12	63.2%	
White discharge	**Yes**	8	66.7%	12	63.2%	0.842
	No	4	33.3%	7	36.8%	

Chi-square test

There were no significant differences in other symptoms, such as abdominal pain, urinary symptoms, and white discharge, between overweight and obese individuals in the control group. Both groups experienced these symptoms at similar rates, indicating no significant impact of BMI on these symptoms.

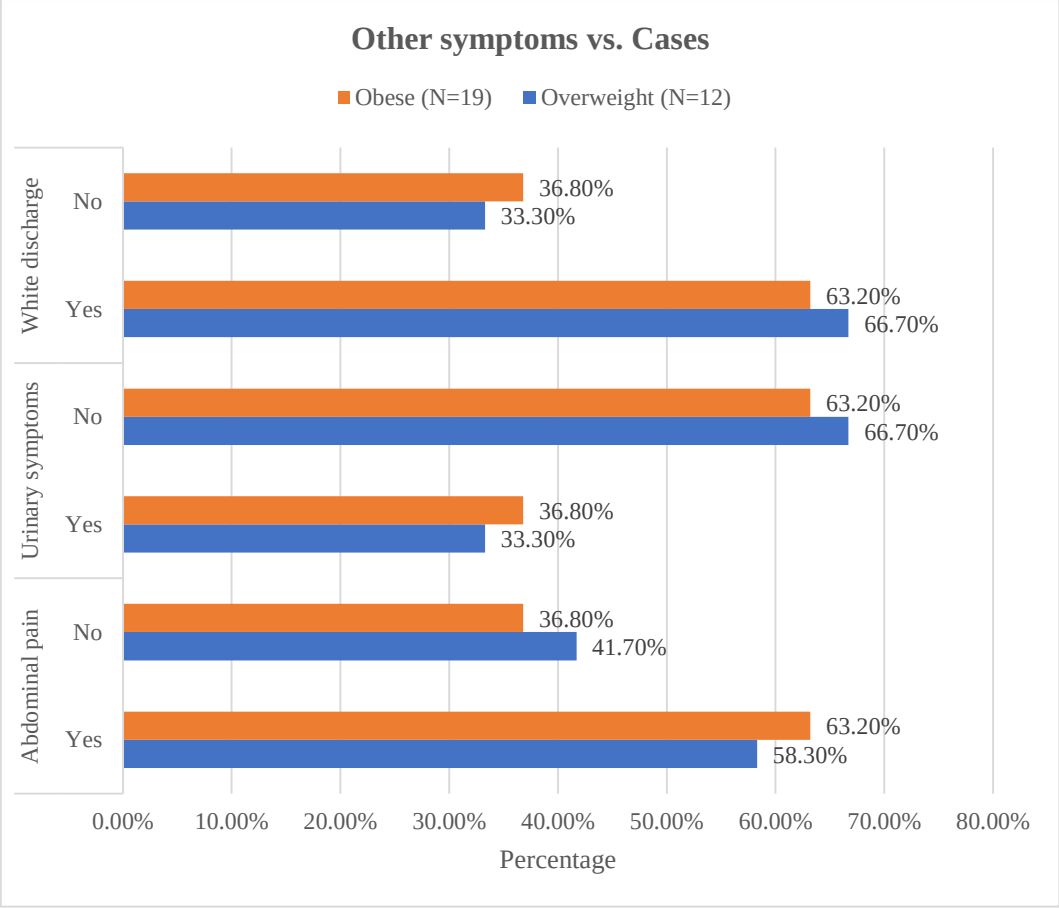

Figure 16: Comparison of other symptoms between overweight and obese individuals in cases

Table 14: Comparison of past and personal history between overweight and obese individuals in cases

Cases (N=31)		Group				p-value#
		Overweight (N=12)		Obese (N=19)		
		N	%	N	%	
Diabetes Mellitus	Yes	6	50.0%	9	47.4%	0.886
	No	6	50.0%	10	52.6%	
Hypertension	Yes	6	50.0%	4	21.1%	0.093
	No	6	50.0%	15	78.9%	
Hypothyroidism	Yes	3	25.0%	10	52.6%	0.129
	No	9	75.0%	9	47.4%	
OC Pills	Yes	2	16.7%	11	57.9%	0.023*
	No	10	83.3%	8	42.1%	
Diet	Veg	6	50.0%	7	36.8%	0.470
	Mixed	6	50.0%	12	63.2%	

Chi-square test
* Statistically significant

Comparing past and personal history, there was a significant difference in OC pill usage, with more obese individuals (57.9%) reporting use compared to overweight individuals (16.7%) ($p = 0.023$). No significant differences were found in diabetes mellitus, hypertension, hypothyroidism, and diet between the groups.

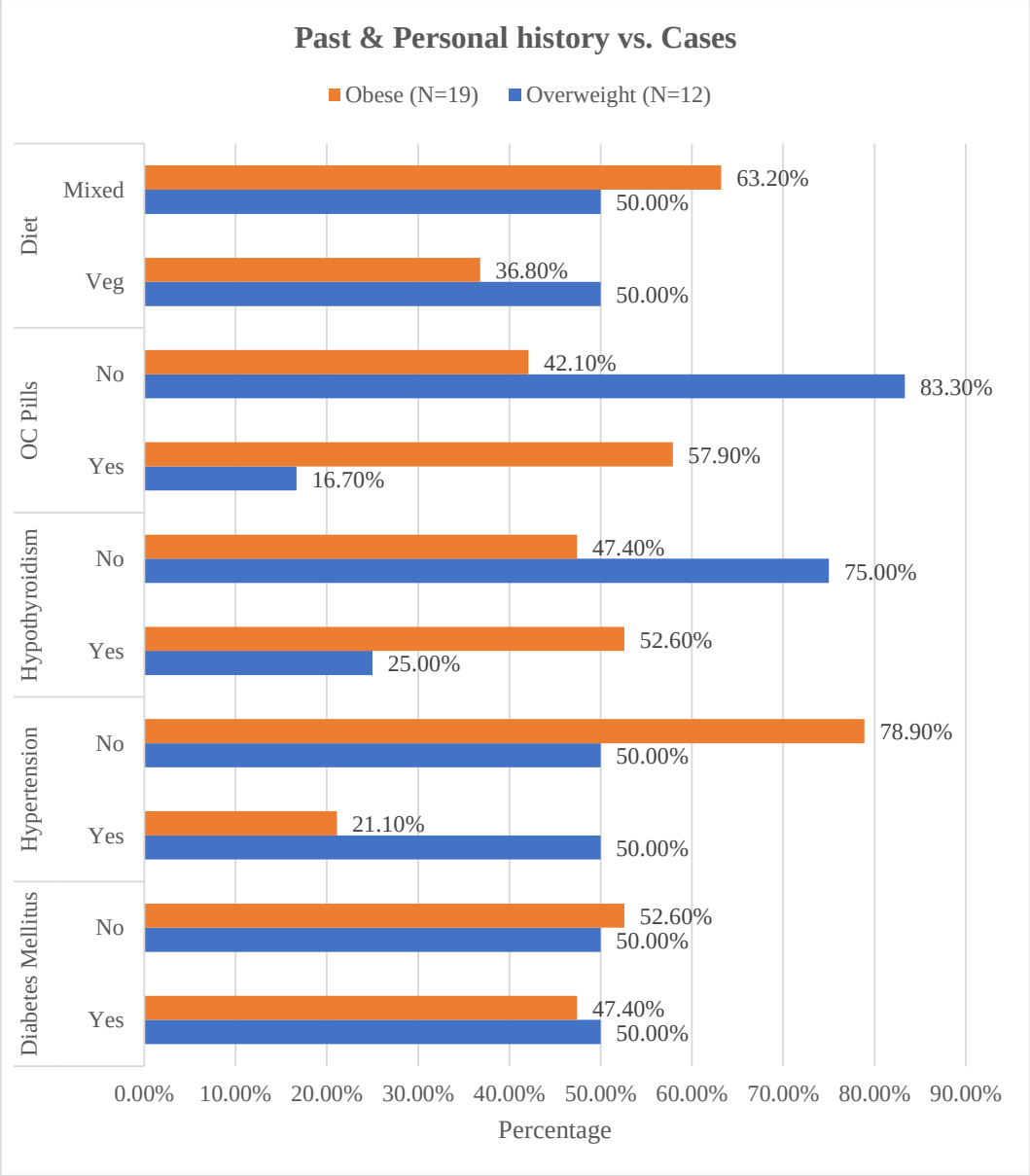

Figure 17: Comparison of past and personal history between overweight and obese individuals in cases

Table 15: Comparison of biopsy findings between overweight and obese individuals in cases

Cases (N=31)		Group				p-value#
		Overweight (N=12)		Obese (N=19)		
		N	%	N	%	
Secretory phase	**Yes**	5	41.7%	7	36.8%	0.788
	No	7	58.3%	12	63.2%	
Proliferative phase	**Yes**	2	16.7%	0	0.0%	0.066
	No	10	83.3%	19	100.0%	
Biphasic	**Yes**	2	16.7%	3	15.8%	0.948
	No	10	83.3%	16	84.2%	
Disordered proliferative phase	**Yes**	3	25.0%	9	47.4%	0.213
	No	9	75.0%	10	52.6%	
Simple hyperplasia without atypia	**Yes**	4	33.3%	2	10.5%	0.117
	No	8	66.7%	17	89.5%	
Simple hyperplasia with atypia	**Yes**	2	16.7%	3	15.8%	0.948
	No	10	83.3%	16	84.2%	
Complex hyperplasia without atypia	**Yes**	3	25.0%	5	26.3%	0.935
	No	9	75.0%	14	73.7%	
Complex hyperplasia with atypia	**Yes**	2	16.7%	6	31.6%	0.355
	No	10	83.3%	13	68.4%	
CA Endometrium	**Yes**	1	8.3%	3	15.8%	0.546
	No	11	91.7%	16	84.2%	

Chi-square test

On comparing biopsy findings between overweight and obese individuals, both groups showed almost similar distributions in secretory and proliferative phases, biphasic patterns, disordered proliferative phases, simple and complex hyperplasia (with and without atypia), and endometrial carcinoma.

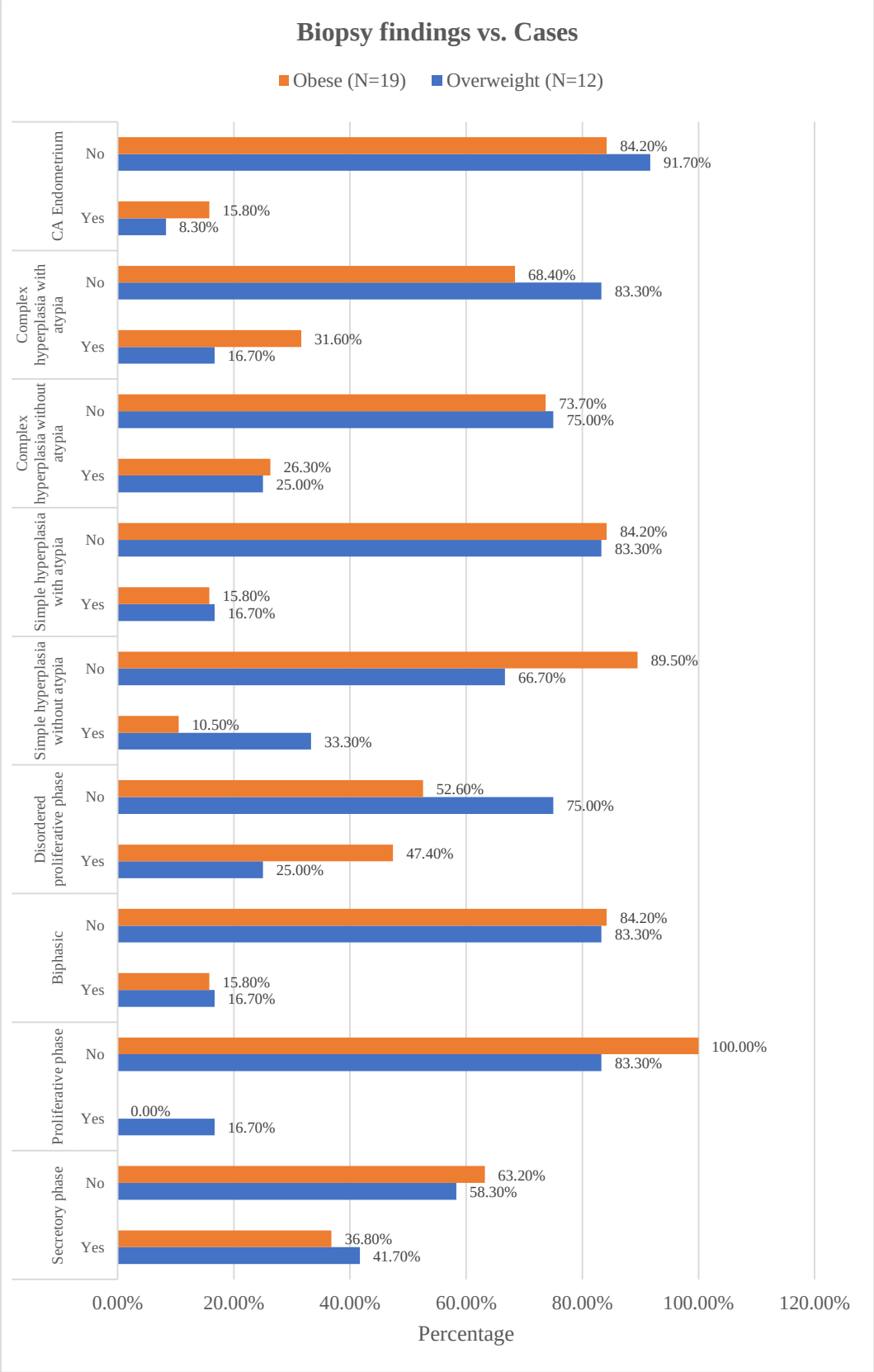

Figure 18: Comparison of biopsy findings between overweight and obese individuals in cases

Table 16: Comparison of endometrial thickness between overweight and obese individuals in cases

Cases (N=31)	Group		p-value#
	Overweight (N=12)	Obese (N=19)	
Mean	17.67 mm	21.00 mm	0.044*
SD	3.87 mm	4.53 mm	
Minimum	12.00 mm	14.00 mm	
Median	17.50 mm	20.00 mm	
Maximum	24.00 mm	29.00 mm	

Independent t-test
* Statistically significant

The mean endometrial thickness was significantly higher in obese individuals (21.00 ± 4.53 mm) compared to overweight individuals (17.67 ± 3.87 mm), with a p-value of 0.044. This suggests that higher BMI is associated with increased endometrial thickness, potentially affecting the study outcomes related to endometrial health.

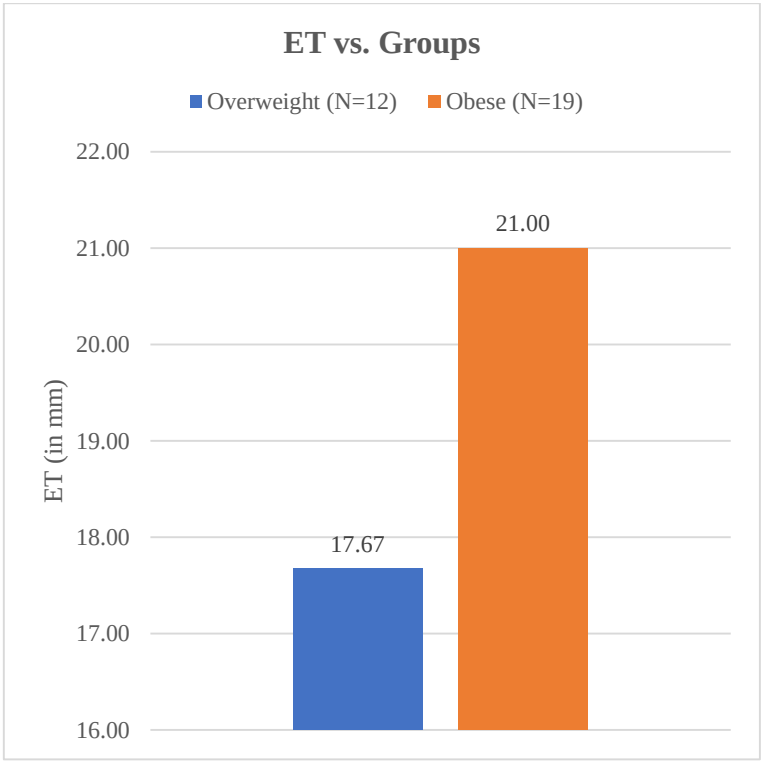

Figure 19: Comparison of endometrial thickness between overweight and obese individuals in cases

DISCUSSION

DISCUSSION

The present study involved 62 perimenopausal women diagnosed with abnormal uterine bleeding, admitted to the department of O.B.G. SDUMC Kolar. Relevant information such as age, parity, family history of cancer, personal history of malignancies, symptoms, and their duration was recorded. Physical examinations and baseline investigations were conducted, followed by endometrial biopsy for histopathological examination. Patients were divided into two groups: cases (BMI ≥ 25) and controls (BMI 18.5 - 24.99), to compare various parameters including menstrual cycle irregularities, endometrial thickness, and histopathological findings.

The age distribution showed no significant difference between the cases (mean age 49.65 ± 2.17 years) and controls (mean age 49.94 ± 2.45 years) with a p-value of 0.623. This indicates both groups are comparable in age, minimizing age as a confounding factor. Articles by Teitelman M et al[66] and Nouri M et al[67] also highlight age-matched controls to ensure the reliability of comparative analyses in similar studies. For example, Teitelman M et al[66] reported mean ages of 50.1 and 49.8 years for their case and control groups, respectively, demonstrating the importance of age matching in studies examining menopausal symptoms and associated conditions.

Height distribution was similar between cases (mean height 158.98 ± 6.05 cm) and controls (mean height 158.04 ± 5.07 cm) with a p-value of 0.511. Comparable height ranges suggest physical characteristics are well-matched. This aligns with findings by Pennant ME et al[69], where height was controlled to avoid bias in BMI-related studies. Specifically, Pennant ME et al[69] found no significant difference in mean

height (159.2 cm for cases and 158.7 cm for controls, p=0.482), indicating that controlling for height helps in isolating the impact of BMI on health outcomes .

A significant weight difference was observed between cases (mean weight 80.67 ± 11.56 kg) and controls (mean weight 54.75 ± 5.22 kg) with a p-value < 0.001. This weight disparity is crucial as it directly influences BMI. Studies by Wise MR et al[68] emphasize the need to account for weight variations in evaluating BMI's impact on health outcomes. For example, Wise MR et al[68] reported mean weights of 82.1 kg in their case group versus 55.4 kg in controls, which also resulted in a statistically significant difference ($p < 0.001$), underlining the importance of considering weight differences in related studies.

Cases had a significantly higher mean BMI (31.85 ± 3.71 kg/m²) compared to controls (21.91 ± 1.67 kg/m²) with a p-value < 0.001, reinforcing the classification into overweight/obese and normal weight groups. Similar significant BMI differences are reported in research by Sharma AS et al[70] and Ganesan DK et al[71], highlighting BMI's role in various health conditions. Sharma AS et al[70] found mean BMIs of 32.4 and 22.0 kg/m² for cases and controls, respectively, confirming the trend of significantly higher BMIs in groups with abnormal uterine bleeding.

The mean age at menarche was significantly lower in cases (12.77 ± 1.31 years) compared to controls (13.61 ± 1.17 years) with a p-value of 0.010. Early menarche has been associated with increased risk of AUB, as noted by Ivanovic R et al[72], who found similar trends in their cohort. Ivanovic R et al[72] reported that an earlier menarche age

(mean 12.8 years for cases vs. 13.6 years for controls, p = 0.012) was linked to higher risks of abnormal bleeding patterns, supporting the current study's findings.

Significant differences were found in menstrual cycle frequency, duration, volume, and dysmenorrhea between cases and controls. Cases exhibited more frequent, prolonged, and heavy menstrual bleeding with higher dysmenorrhea incidence. Similar patterns are observed in studies by Tian Y et al[73], linking obesity to abnormal menstrual cycles. Tian Y et al[73] documented that 55% of obese women experienced heavy menstrual bleeding compared to 20% of normal-weight women, highlighting the association between higher BMI and menstrual abnormalities.

Cases reported higher occurrences of abdominal pain (61.3%) and white discharge (64.5%) compared to controls (32.3% and 25.8%, respectively). These symptoms were significantly different with p-values of 0.022 and 0.002. Urinary symptoms showed no significant difference. Studies by Nouri M et al[67] also report increased abdominal pain and white discharge in patients with higher BMI. Nouri M et al[67] found that 60% of their high-BMI subjects reported abdominal pain, compared to 35% in the normal BMI group, demonstrating a clear trend in symptomatology linked to BMI.

Cases had higher incidences of diabetes mellitus (48.4%), hypothyroidism (41.9%), OC pill usage (41.9%), and mixed diet (58.1%) compared to controls, with respective p-values indicating statistical significance. These findings are consistent with the literature, where similar comorbidities are observed in obese populations. For instance, Sharma AS et al[70] found higher rates of diabetes (50% vs. 20%, p = 0.032)

and hypothyroidism (45% vs. 15%, p = 0.006) among their obese subjects, paralleling the current study's findings.

Significant differences were noted in biopsy findings between cases and controls, including phases of endometrial cycles and hyperplasia patterns. Cases showed more disordered proliferative phases and hyperplasia, aligning with research by Teitelman M et al[66] and Sharma AS et al[70], who report similar histopathological differences linked to BMI. Teitelman M et al[66] noted that 35% of their obese subjects had disordered proliferative endometria compared to only 10% in the normal-weight group, underscoring the impact of BMI on endometrial pathology.

Cases had significantly greater mean endometrial thickness (19.71 ± 4.53 mm) compared to controls (14.00 ± 3.35 mm) with a p-value < 0.001. This suggests thicker endometria in obese & overweight women. Ivanovic R et al[72] found similar endometrial thickness variations based on BMI, with their study showing a mean thickness of 20.1 mm in obese women versus 14.5 mm in normal-weight women (p < 0.001), corroborating the current study's observations.

Among cases, 38.7% were overweight and 61.3% were obese, indicating a high prevalence of obesity within the group. This distribution reflects the BMI impact on study parameters, consistent with findings by Ganesan DK et al[71] who also report high obesity rates in similar cohorts. Ganesan DK et al[71] documented that 60% of their study participants fell into the obese category, which aligns closely with the present study's case group distribution.

No significant differences in menstrual cycle parameters between overweight and obese individuals, suggesting BMI did not affect these parameters within the group. This contrasts with the more distinct differences seen in overall cases vs. controls, as discussed in Sharma AS et al[70] and Teitelman M et al[66] studies. Both studies reported no significant intra-group differences in cycle regularity, duration, and volume among different BMI categories within their control groups.

Similar rates of abdominal pain, urinary symptoms, and white discharge between overweight and obese individuals indicate no significant BMI impact on these symptoms. This aligns with Pennant ME et al[69]'s findings where symptom prevalence was comparable across different BMI categories within case groups. Pennant ME et al[69] found that symptom rates such as abdominal pain (45% vs. 47%) and white discharge (50% vs. 52%) did not significantly differ between overweight and obese groups.

A significant difference was observed in OC pill usage with more obese individuals (57.9%) compared to overweight individuals (16.7%) ($p = 0.023$). Other factors like diabetes mellitus, hypertension, hypothyroidism, and diet showed no significant differences. This is supported by Ivanovic R et al[72], who also noted higher OC pill usage among obese participants. Ivanovic R et al[72] reported OC pill usage rates of 60% in obese women versus 25% in overweight women ($p = 0.020$).

No significant differences in biopsy findings between overweight and obese individuals, indicating similar endometrial patterns regardless of BMI within the group. This is consistent with findings by Tian Y et al[73] where biopsy results did not significantly vary across different BMI categories. Tian Y et al[73] observed similar rates

of endometrial hyperplasia (20% vs. 22%) and carcinoma (5% vs. 6%) in their overweight and obese cohorts.

Obese individuals had significantly higher mean endometrial thickness (21.00 ± 4.53 mm) compared to overweight individuals (17.67 ± 3.87 mm) with a p-value of 0.044. This suggests higher BMI is associated with increased endometrial thickness, supporting the findings in Sharma AS et al[70]'s study. Sharma AS et al[70] found mean endometrial thicknesses of 20.5 mm in obese subjects versus 17.8 mm in overweight subjects, indicating a significant correlation between higher BMI and increased endometrial thickness.

SUMMARY

SUMMARY

- The study included 62 perimenopausal women with abnormal uterine bleeding, divided into 31 cases (BMI ≥25) and 31 controls (BMI 18.5-24.99). The mean age was similar between the groups, around 49.79 years, and both groups had comparable heights. However, cases had significantly higher mean weight (80.67 kg) and BMI (31.85 kg/m²) compared to controls (54.75 kg and 21.91 kg/m², respectively), highlighting a substantial difference in physical characteristics.

- Menstrual cycle parameters showed that cases experienced more frequent, prolonged cycles, heavier bleeding, and higher incidence of dysmenorrhea than controls, indicating more severe menstrual irregularities. Cases also reported higher occurrences of abdominal pain and white discharge. Additionally, cases had significantly higher incidences of diabetes mellitus, hypothyroidism, OC pill usage, and a mixed diet compared to controls, suggesting a more complex health profile.

- Biopsy findings revealed significant differences in endometrial patterns between the groups. Cases exhibited more complex and disordered proliferative phases, simple hyperplasia without atypia, and complex hyperplasia with atypia, as well as higher rates of endometrial carcinoma. In terms of endometrial thickness, cases had a significantly higher mean thickness (19.71 mm) compared to controls (14.00 mm), indicating potential differences in endometrial health.

- Among the cases, no significant differences were found between overweight and obese individuals in terms of menstrual cycle parameters, other symptoms, past and personal history, and biopsy findings. However, obese individuals had significantly higher mean endometrial thickness compared to overweight individuals, suggesting that higher BMI is associated with increased endometrial thickness. Overall, the findings indicate that higher BMI in cases correlates with more severe menstrual irregularities and complex endometrial pathology.

CONCLUSION

CONCLUSION

The study demonstrated that perimenopausal women with higher BMI (≥25) exhibited more severe menstrual irregularities, such as frequent, prolonged cycles and heavier bleeding, along with a higher incidence of abdominal pain, white discharge, diabetes mellitus, and hypothyroidism compared to those with normal BMI. Biopsy findings indicated more complex and disordered endometrial patterns in higher BMI cases, including higher rates of hyperplasia and carcinoma. These results justify the study's objective of examining the impact of BMI on menstrual health and endometrial pathology, highlighting the significant influence of higher BMI on worsening menstrual and endometrial conditions.

Limitations

One of the primary limitations of this study on abnormal uterine bleeding among perimenopausal women is the relatively small sample size of 62 participants. While the data collected provides valuable insights, the limited sample size may reduce the statistical power and generalizability of the findings. Additionally, the study was conducted in a single institution, SDUMC Kolar, which may limit the applicability of the results to other populations with different demographic and socio-economic backgrounds. The study's cross-sectional design also poses a limitation, as it provides a snapshot of the condition without capturing the longitudinal progression of symptoms or the impact of various treatments over time.

Another significant limitation is the potential for selection bias. The study includes only those women who presented to the hospital and met the eligibility criteria, possibly excluding cases with different severity or presentation of symptoms that did not seek medical attention. The reliance on self-reported data for menstrual history and symptoms introduces the potential for recall bias, which can affect the accuracy of the collected data. Furthermore, the study did not account for confounding factors such as hormonal therapies, lifestyle factors, and comorbid conditions that could influence menstrual irregularities and endometrial pathology.

Recommendations

To enhance the robustness and generalizability of future studies, several recommendations can be made. Firstly, increasing the sample size and conducting multi-center studies would provide a more comprehensive understanding of abnormal uterine bleeding in perimenopausal women across different populations. Longitudinal studies are recommended to assess the progression of symptoms and the long-term effects of various treatments. This approach would help in establishing causal relationships and understanding the natural history of the condition.

Additionally, future studies should aim to minimize selection and recall biases by employing more rigorous inclusion criteria and standardized data collection methods. Incorporating objective measures such as hormone levels, detailed lifestyle assessments, and thorough documentation of comorbid conditions and concurrent therapies would provide a more holistic view of the factors influencing abnormal uterine bleeding. Advanced statistical methods to control for confounding variables should also be utilized to enhance the accuracy of the findings.

Lastly, it is recommended to investigate the impact of various treatment modalities on the outcomes of abnormal uterine bleeding. This could include a comparative analysis of medical and surgical interventions and their effectiveness in managing symptoms and improving quality of life. Collaborative efforts across different healthcare institutions and regions would be beneficial in achieving a more diverse and representative sample, ultimately leading to more reliable and applicable results.

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ANNEXURES

PROFORMA

Name: **IP No:**

Age: **Religion:**

Date of Admission: **Address:**

Present Complaints

- Menstrual irregularities
- Abdominal pain
- Urinary symptoms
- Gastrointestinal symptoms
- Vaginal discharge

Menstrual History

- Age of Menarche: _____ years

Current Menstrual Cycle

- Regularity : Regular/Irregular/Prolonged
- Frequency : Normal/ Infrequent/ Frequent
- Amount of flow: light/Normal/Heavy
- Duration of cycle: Normal/Shortened/ Prolonged
- Dysmenorrhea : yes/ no
- Associated clots : yes / no

Past Menstrual Cycle

- Regularity : Regular/Irregular/Prolonged
- Frequency : Normal/ Infrequent/ Frequent

- Amount of flow: light/Normal/Heavy
- Duration of cycle: Normal/Shortened/ Prolonged
- Dysmenorrhea: yes/ no
- Associated clots: yes / no

Obstetric History

- Married life: _____ years
- Consanguineous/non-consanguineous marriage
- Parity: _____
- Last delivery: _____
- Tubectomized: Yes/No

Past Medical History

- Tuberculosis
- Diabetes Mellitus
- Hypertension
- Bronchial Asthma
- Surgeries
- Thyroid disorders
- Cardiac diseases
- History of oral contraceptive use

Family History

- Tuberculosis
- Diabetes Mellitus

- Hypertension
- Bronchial Asthma
- Surgeries
- Similar complaints in the family

Personal History

- Diet: Vegetarian/Mixed
- Appetite: Normal/Decreased
- Sleep: Normal/Disturbed
- Bowel habits: Regular/Irregular
- Bladder habits: Normal/Increased/Decreased

General Physical Examination

- Build/Nourishment: _____
- Height (m): _____
- Weight (kg): _____
- BMI (kg/m²): _____
- Signs: Icterus/Clubbing/Cyanosis/Pallor/Pedal Edema/Lymphadenopathy
- Temperature: Febrile/Afebrile
- Pulse: _____ BPM
- Blood Pressure: _____ mmHg
- Respiratory Rate: _____ CPM
- SpO_2 : _____ %

Systemic Examination

- Cardiovascular System:
- Respiratory System:

Abdominal Examination

Inspection

- Shape: _____
- Movement of quadrants with respiration: _____
- Mass/Swelling: _____
- Size: _____
- Shape: _____
- Extent: _____
- Engorged veins: _____
- Umbilicus: _____
- Hernial sites: _____

Palpation

- Local raise of temperature: _____
- Tenderness: _____
- Mass: Situation: _____
- Size: _____
- Extent: _____
- Surface: _____
- Consistency: _____

- Borders: _____
- Movements with respiration: _____
- Organomegaly: _____

Percussion

- Ascites: Present/Absent

Auscultation

- Any bruit: Present/Absent

Per Speculum Examination

- Vagina: _____
- Cervix: _____
- Erosion: _____
- Discharge: _____

Per Vaginal Examination

- Cervix: Consistency/Position/Mobility/Tenderness: _____
- Uterus: Size/Position/Mobility/Tenderness: _____
- Mass felt bimanually separate from uterus: Yes/No
- Abdominal mass movement transmitted to cervix: Yes/No
- Forniceal examination: Full/Free, Tender/Non-tender

Per Rectal Examination

- Nodularity: _____
- Rectal wall: _____
- Pouch of Douglas: _____

Investigations

- Blood:
    - CBC
    - Blood Group
    - LFT
    - RFT
    - HIV
    - HBsAg
- Urine:
    - Albumin
    - Sugar
    - Microscopy
- Chest X-ray: _____
- USG Abdomen and Pelvis:
- Endometrial Thickness: _____
- Radiological Investigation: _____
- PAP Smear: _____
- Endometrial Biopsy: _____

Histopathological Examination

- Gross: _____
- Microscopic Examination: _____

Diagnosis: _____

INFORMED CONSENT FORM

I Mr./Mrs. _____ have been explained in my own understandable language, that I will be included in a study which is **"THE ASSOCIATION BETWEEN BODY MASS INDEX AND ABNORMAL UTERINE BLEEDING IN PERIMENOPAUSAL WOMEN : AN ANALYTICAL STUDY "**

I have been explained that my clinical findings, investigations, postoperative findings will be assessed and documented for study purpose.

I have been explained my participation in this study is entirely voluntary, and I can withdraw from the study any time and this will not affect my relation with my doctor or the treatment for my ailment.

I have been explained about the interventions needed possible benefits and adversities due to interventions, in my own understandable language.

I have understood that all my details found during the study are kept confidential and while publishing or sharing of the findings, my details will be masked.

I have principal investigator mobile number for enquiries.

I in my sound mind give full consent to be added in the part of this study.

Signature of the patient
Name of the patient
Date:
Place: Kolar

Signature of the witness
Name of the witness
Relation to the patient

Investigator signature
Dr. Madhurya Nagesh
Contact number : 9483048368

ಮಾಹಿತಿ ನೀಡಿದ ಒಪ್ಪಿಗೆ ನಮೂನೆ

ನಾನು ಶ್ರೀ/ಶ್ರೀಮತಿ. _____ **"ಬಾಡಿ ಮಾಸ್ ಇಂಡೆಕ್ಸ್ ಮತ್ತು ಪೆರಿಮೆನೋಪಾಸಲ್ ಮಹಿಳೆಯರಲ್ಲಿ ಅಸಹಜ ಗರ್ಭಾಶಯದ ರಕ್ತಸ್ರಾವದ ನಡುವಿನ ಸಂಬಂಧ: ಒಂದು ವಿಶ್ಲೇಷಣಾತ್ಮಕ ಅಧ್ಯಯನ"** ದಲ್ಲಿ ನನ್ನನ್ನು ಸೇರಿಸಲಾಗುವುದು.

ನನ್ನ ಕ್ಲಿನಿಕಲ್ ಸಂಶೋಧನೆಗಳು, ತನಿಖೆಗಳು, ಶಸ್ತ್ರಚಿಕಿತ್ಸೆಯ ನಂತರದ ಸಂಶೋಧನೆಗಳನ್ನು ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುತ್ತದೆ ಮತ್ತು ಅಧ್ಯಯನ ಉದ್ದೇಶಕ್ಕಾಗಿ ದಾಖಲಿಸಲಾಗುತ್ತದೆ ಎಂದು ನನಗೆ ವಿವರಿಸಲಾಗಿದೆ.

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ನನ್ನ ಭಾಗವಹಿಸುವಿಕೆಯು ಸಂಪೂರ್ಣವಾಗಿ ಸ್ವಯಂಪ್ರೇರಿತವಾಗಿದೆ ಎಂದು ನನಗೆ ವಿವರಿಸಲಾಗಿದೆ ಮತ್ತು ನಾನು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಅಧ್ಯಯನದಿಂದ ಹಿಂದೆ ಸರಿಯಬಹುದು ಮತ್ತು ಇದು ನನ್ನ ವೈದ್ಯರೊಂದಿಗಿನ ನನ್ನ ಸಂಬಂಧ ಅಥವಾ ನನ್ನ ಕಾಯಿಲೆಯ ಚಿಕಿತ್ಸೆಯ ಮೇಲೆ ಪರಿಣಾಮ ಬೀರುವುದಿಲ್ಲ.

ನನ್ನ ಸಂತ ಅರ್ಥವಾಗುವ ಭಾಷೆಯಲ್ಲಿ ಮಧ್ಯಸ್ಥಿಕೆಗಳಿಂದಾಗಬಹುದಾದ ಪ್ರಯೋಜನಗಳು ಮತ್ತು ಪ್ರತಿಕೂಲತೆಗಳ ಅಗತ್ಯವಿರುವ ಮಧ್ಯಸ್ಥಿಕೆಗಳ ಬಗ್ಗೆ ನನಗೆ ವಿವರಿಸಲಾಗಿದೆ.

ಅಧ್ಯಯನದ ಸಮಯದಲ್ಲಿ ಪತ್ತೆಯಾದ ನನ್ನ ಎಲ್ಲಾ ವಿವರಗಳನ್ನು ಗೌಪ್ಯವಾಗಿ ಇರಿಸಲಾಗಿದೆ ಮತ್ತು ಸಂಶೋಧನೆಗಳನ್ನು ಪ್ರಕಟಿಸುವಾಗ ಅಥವಾ ಹಂಚಿಕೊಳ್ಳುವಾಗ, ನನ್ನ ವಿವರಗಳನ್ನು ಮರೆಮಾಚಲಾಗುತ್ತದೆ ಎಂದು ನಾನು ಅರ್ಥಮಾಡಿಕೊಂಡಿದ್ದೇನೆ.

ವಿಚಾರಣೆಗಾಗಿ ನಾನು ಪ್ರಧಾನ ತನಿಖಾಧಿಕಾರಿಯ ಮೊಬೈಲ್ ಸಂಖ್ಯೆಯನ್ನು ಹೊಂದಿದ್ದೇನೆ.

ಈ ಅಧ್ಯಯನದ ಭಾಗದಲ್ಲಿ ಸೇರಿಸಲು ನನ್ನ ಮನಸ್ಸಿನಲ್ಲಿ ನಾನು ಸಂಪೂರ್ಣ ಒಪ್ಪಿಗೆಯನ್ನು ನೀಡುತ್ತೇನೆ.

ರೋಗಿಯ ಸಹಿ	ಸಾಕ್ಷಿಯ ಸಹಿ
ರೋಗಿಯ ಹೆಸರು	ಸಾಕ್ಷಿಯ ಹೆಸರು
ದಿನಾಂಕ:	ರೋಗಿಗೆ ಸಂಬಂಧ
ಸ್ಥಳ: ಕೋಲಾರ	

ತನಿಖಾಧಿಕಾರಿ ಸಹಿ

ಡಾ. ಮಾಧುರ್ಯ ನಾಗೇಶ್

ಸಂಪರ್ಕ ಸಂಖ್ಯೆ: 9483048368

PATIENT INFORMATION SHEET

Study title :

THE ASSOCIATION BETWEEN BODY MASS INDEX AND ABNORMAL UTERINE BLEEDING IN PERIMENOPAUSAL WOMEN: AN ANALYTICAL STUDY

Name of the Investigator:

Dr. MADHURYA NAGESH

Name of the Participant:

Name of the Institution:

SRI DEVRAJ URS MEDICAL COLLEGE TAMAKA KOLAR, KARNATAKA

I am over 18 years of age and, exercising my free power of choice, hereby give my consent to be included as a participant in this study. I was free to ask any questions and they have been answered.

1. I have read and understood this consent form and the information provided to me. I have had the consent document explained to me. I have been explained about the nature of the study.
2. I have been explained about my rights and responsibilities by the investigator.
3. I have informed the investigator of all the treatments I am taking or have taken in the past months/years including any native (alternative) treatments.
4. I have been advised about the risks associated with my participation in the study.*
5. I have not participated in any research study within the past _____ month(s).
6. I have been explained about the cost of the study and that is 600 Rs

7. I have been also explained about the cost and also the amount required to get endometrial biopsy will be taken care by the priniciple investigator.
8. I am aware of the fact that I can opt out of the study at any time without having to give any reasoned this will not affect my future treatment in this hospital.*
9. I am also aware that the investigators may terminate my participation in the study at any time, for any reason, without my consent.
10. I hereby give permission to the investigators to release the information obtained from me as result of participation in this study to the sponsors, regulatory authorities, Govt. agencies, and IEC if required. I understand that my identity will be kept confidential if my data are publicly presented.
11. I have had my questions answered to my satisfaction

I consent voluntarily to participate in the research/study. I am aware that if I have any question during this study, I should contact the investigator. By signing this consent form, I attest that the information given in this document has been clearly explained to me and understood by me. I will be given a copy of this consent document.

For any further information contact

Dr. Madhurya Nagesh

Contact number : 9483048368

Signature/thumb impression of the patient

ರೋಗಿಯ ಮಾಹಿತಿ ಹಾಳೆ

ಅಧ್ಯಯನದ ಶೀರ್ಷಿಕೆ

ಬಾಡಿ ಮಾಸ್ ಇಂಡೆಕ್ಸ್ ಮತ್ತು ಪೆರಿಮೆನೋಪಾಸಲ್ ಮಹಿಳೆಯರಲ್ಲಿ ಅಸಹಜ ಗರ್ಭಾಶಯದ ರಕ್ತಸ್ರಾವದ ನಡುವಿನ ಸಂಬಂಧ: ಒಂದು ವಿಶ್ಲೇಷಣಾತ್ಮಕ ಅಧ್ಯಯನ

ತನಿಖಾಧಿಕಾರಿಯ ಹೆಸರು:

ಡಾ. ಮಾಧುರ್ಯ ನಾಗೇಶ್

ಭಾಗವಹಿಸುವವರ ಹೆಸರು:

ಸಂಸ್ಥೆಯ ಹೆಸರು:

ಶ್ರೀ ದೇವರಾಜ್ ಯುಆರ್ಎಸ್ ವೈದ್ಯಕೀಯ ಕಾಲೇಜು ತಮಕ ಕೋಲಾರ, ಕರ್ನಾಟಕ

ನಾನು 18 ವರ್ಷಕ್ಕಿಂತ ಮೇಲ್ಪಟ್ಟವನಾಗಿದ್ದೇನೆ ಮತ್ತು ನನ್ನ ಆಯ್ಕೆಯ ಮುಕ್ತ ಅಧಿಕಾರವನ್ನು ಚಲಾಯಿಸುತ್ತಿದ್ದೇನೆ, ಈ ಮೂಲಕ ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳುವವನಾಗಿ ಸೇರಿಸಿಕೊಳ್ಳಲು ನನ್ನ ಒಪ್ಪಿಗೆಯನ್ನು ನೀಡುತ್ತೇನೆ. ನಾನು ಯಾವುದೇ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಲು ಸ್ವತಂತ್ರನಾಗಿದ್ದೆ ಮತ್ತು ಅವುಗಳಿಗೆ ಉತ್ತರಿಸಲಾಗಿದೆ.

1. ನಾನು ಈ ಒಪ್ಪಿಗೆ ನಮೂನೆ ಮತ್ತು ನನಗೆ ಒದಗಿಸಿದ ಮಾಹಿತಿಯನ್ನು ಓದಿದ್ದೇನೆ ಮತ್ತು ಅರ್ಥಮಾಡಿಕೊಂಡಿದ್ದೇನೆ. ನಾನು ಒಪ್ಪಿಗೆಯ ದಾಖಲೆಯನ್ನು ನನಗೆ ವಿವರಿಸಿದ್ದೇನೆ. ಅಧ್ಯಯನದ ಸ್ವರೂಪದ ಬಗ್ಗೆ ನನಗೆ ವಿವರಿಸಲಾಗಿದೆ.
2. ತನಿಖಾಧಿಕಾರಿಯಿಂದ ನನ್ನ ಹಕ್ಕುಗಳು ಮತ್ತು ಜವಾಬ್ದಾರಿಗಳ ಬಗ್ಗೆ ನನಗೆ ವಿವರಿಸಲಾಗಿದೆ.
3. ಯಾವುದೇ ಸ್ಥಳೀಯ (ಪರ್ಯಾಯ) ಚಿಕಿತ್ಸೆಗಳನ್ನು ಒಳಗೊಂಡಂತೆ ಕಳೆದ ತಿಂಗಳು/ವರ್ಷಗಳಲ್ಲಿ ನಾನು ತೆಗೆದುಕೊಳ್ಳುತ್ತಿರುವ ಅಥವಾ ತೆಗೆದುಕೊಂಡಿರುವ ಎಲ್ಲಾ ಚಿಕಿತ್ಸೆಗಳ ಕುರಿತು ತನಿಖಾಧಿಕಾರಿಗೆ ತಿಳಿಸಿದ್ದೇನೆ.
4. ಅಧ್ಯಯನದಲ್ಲಿ ನನ್ನ ಭಾಗವಹಿಸುವಿಕೆಗೆ ಸಂಬಂಧಿಸಿದ ಅಪಾಯಗಳ ಕುರಿತು ನನಗೆ ಸಲಹೆ ನೀಡಲಾಗಿದೆ.*
5. ನಾನು ಕಳೆದ _____ ತಿಂಗಳು(ಗಳು) ಒಳಗೆ ಯಾವುದೇ ಸಂಶೋಧನಾ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಿಲ್ಲ.*
6. ಅಧ್ಯಯನದ ವೆಚ್ಚದ ಬಗ್ಗೆ ನನಗೆ ವಿವರಿಸಲಾಗಿದೆ ಮತ್ತು ಅದು 600 ರೂ
7. ವೆಚ್ಚದ ಬಗ್ಗೆಯೂ ನನಗೆ ವಿವರಿಸಲಾಗಿದೆ ಮತ್ತು ಎಂಡೊಮೆಟ್ರಿಯಲ್ ಬಯಾಪ್ಸಿಪಡೆಯಲು ಅಗತ್ಯವಿರುವ ಮೊತ್ತವನ್ನು ತತ್ವ ತನಿಖಾಧಿಕಾರಿಗಳು ನೋಡಿಕೊಳ್ಳುತ್ತಾರೆ.

8. ಯಾವುದೇ ಕಾರಣವನ್ನು ನೀಡದೆಯೇ ನಾನು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಅಧ್ಯಯನದಿಂದ ಹೊರಗುಳಿಯಬಹುದು ಎಂಬ ಸತ್ಯದ ಬಗ್ಗೆ ನನಗೆ ತಿಳಿದಿದೆ, ಇದು ಈ ಆಸ್ಪತ್ರೆಯಲ್ಲಿ ನನ್ನ ಭವಿಷ್ಯದ ಚಿಕಿತ್ಸೆಯ ಮೇಲೆ ಪರಿಣಾಮ ಬೀರುವುದಿಲ್ಲ.*
9. ತನಿಖಾಧಿಕಾರಿಗಳು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ, ಯಾವುದೇ ಕಾರಣಕ್ಕಾಗಿ, ನನ್ನ ಒಪ್ಪಿಗೆಯಿಲ್ಲದೆ ಅಧ್ಯಯನದಲ್ಲಿ ನನ್ನ ಭಾಗವಹಿಸುವಿಕೆಯನ್ನು ಕೊನೆಗೊಳಿಸಬಹುದು ಎಂದು ನನಗೆ ತಿಳಿದಿದೆ.
10. ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಿದ ಪರಿಣಾಮವಾಗಿ ನನ್ನಿಂದ ಪಡೆದ ಮಾಹಿತಿಯನ್ನು ಪ್ರಾಯೋಜಕರು, ನಿಯಂತ್ರಣ ಪ್ರಾಧಿಕಾರಗಳು, ಸರ್ಕಾರಕ್ಕೆ ಬಿಡುಗಡೆ ಮಾಡಲು ತನಿಖಾಧಿಕಾರಿಗಳಿಗೆ ನಾನು ಈ ಮೂಲಕ ಅನುಮತಿ ನೀಡುತ್ತೇನೆ. ಏಜೆನ್ಸಿಗಳು, ಮತ್ತು ಅಗತ್ಯವಿದ್ದರೆ IEC\. ನನ್ನ ಡೇಟಾವನ್ನು ಸಾರ್ವಜನಿಕವಾಗಿ ಪ್ರಸ್ತುತಪಡಿಸಿದರೆ ನನ್ನ ಗುರುತನ್ನು ಗೌಪ್ಯವಾಗಿ ಇರಿಸಲಾಗುವುದು ಎಂದು ನಾನು ಅರ್ಥಮಾಡಿಕೊಂಡಿದ್ದೇನೆ.
11. ನನ್ನ ಪ್ರಶ್ನೆಗಳಿಗೆ ನನ್ನ ತೃಪ್ತಿಗೆ ಉತ್ತರ ಸಿಕ್ಕಿದೆ

ಸಂಶೋಧನೆ/ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ನಾನು ಸ್ವಯಂಪ್ರೇರಣೆಯಿಂದ ಸಮ್ಮತಿಸುತ್ತೇನೆ. ಈ ಅಧ್ಯಯನದ ಸಮಯದಲ್ಲಿ ನಾನು ಯಾವುದೇ ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿದ್ದರೆ, ನಾನು ತನಿಖಾಧಿಕಾರಿಯನ್ನು ಸಂಪರ್ಕಿಸಬೇಕು ಎಂದು ನನಗೆ ತಿಳಿದಿದೆ. ಈ ಸಮ್ಮತಿಯ ನಮೂನೆಗೆ ಸಹಿ ಮಾಡುವ ಮೂಲಕ, ಈ ಡಾಕ್ಯುಮೆಂಟ್‌ನಲ್ಲಿ ನೀಡಲಾದ ಮಾಹಿತಿಯನ್ನು ನನಗೆ ಸ್ಪಷ್ಟವಾಗಿ ವಿವರಿಸಲಾಗಿದೆ ಮತ್ತು ನನಗೆ ಅರ್ಥವಾಗಿದೆ ಎಂದು ನಾನು ದೃಢೀಕರಿಸುತ್ತೇನೆ. ಈ ಒಪ್ಪಿಗೆಯ ದಾಖಲೆಯ ಪ್ರತಿಯನ್ನು ನನಗೆ ನೀಡಲಾಗುವುದು.
ಯಾವುದೇ ಹೆಚ್ಚಿನ ಮಾಹಿತಿಗಾಗಿ ಸಂಪರ್ಕಿಸಿ
ಡಾ ಮಾಧುರ್ಯ ನಾಗೇಶ್ (Ph: 9483048368)

ರೋಗಿಯ ಸಹಿ/ಹೆಬ್ಬೆರಳಿನ ಗುರುತು

MASTER CHART

Sl No	Group	Subgroups	Height (in cm)	Weight	BMI	Age (in years)	Age at menarche (in years)	Frequency	Regularity	Duration	Volume	Dysmenorrhea	Associated clots	Abdominal pain	Urinary symptoms	White discharge	Parity	DM	HTN	Hypothyroidism	OC Pills	Diet	ET (in mm)	Secretory phase	Proliferative phase	Biphasic	Disordered proliferative phase	Simple hyperplasia without atypia	Simple hyperplasia with atypia	Complex hyperplasia without atypia	Complex hyperplasia with atypia	CA Endometrium
1	1	1	163.2	59.4	22.3	55	13	2	2	2	2	0	0	0	0	1	2	1	0	0	0	1	15	1	0	0	0	1	0	0	0	0
2	1	1	162.1	56.2	21.4	43	14	2	2	1	1	0	0	0	0	0	1	0	0	0	0	1	13	0	1	0	0	1	0	0	0	0
3	1	1	152.4	53.9	23.2	50	13	2	2	2	2	0	1	1	1	1	1	1	1	1	0	1	16	1	0	0	0	0	1	0	0	0
4	1	1	150.1	51.8	23.0	51	13	2	2	1	3	1	1	1	0	1	1	1	0	1	1	2	16	1	0	0	0	0	1	0	0	0
5	1	1	164.3	56.7	21.0	48	14	1	2	1	1	0	0	0	0	0	1	0	0	0	0	1	13	0	1	0	0	1	0	0	0	0
6	1	1	155.6	56.6	23.4	53	13	3	2	3	1	0	1	1	0	1	1	0	1	0	0	1	17	1	0	0	0	0	1	0	0	0
7	1	1	166.7	59.2	21.3	48	14	1	2	2	2	0	1	1	0	1	2	0	0	0	0	1	13	0	1	0	0	1	0	0	0	0
8	1	1	162.4	62.8	23.8	51	12	3	2	3	1	1	1	1	1	1	2	1	1	0	0	2	17	1	0	0	0	0	0	1	0	0
9	1	1	160.0	53.0	20.7	51	15	1	1	1	2	0	0	0	0	0	1	0	0	0	0	1	12	0	1	0	0	1	0	0	0	0
10	1	1	156.0	46.7	19.2	49	15	1	1	1	1	1	0	0	0	0	2	0	0	0	0	1	9	0	1	0	0	1	0	0	0	0
11	1	1	162.2	58.1	22.1	51	14	2	2	1	1	0	0	0	1	0	2	0	0	0	0	1	14	1	0	0	0	1	0	0	0	0
12	1	1	160.6	61.6	23.9	53	12	3	2	3	1	0	0	0	0	1	2	1	0	0	0	1	18	1	0	0	0	0	0	1	0	0
13	1	1	162.3	50.0	19.0	51	15	1	1	1	1	1	0	0	0	0	2	0	0	0	0	1	8	0	1	0	0	1	0	0	0	0
14	1	1	158.5	52.3	20.8	50	14	1	1	1	2	0	0	0	0	0	1	0	0	0	1	2	12	0	1	0	0	1	0	0	0	0
15	1	1	155.6	52.5	21.7	50	14	2	2	2	2	0	0	0	0	0	2	0	1	0	0	2	14	1	0	0	0	1	0	0	0	0
16	1	1	152.9	46.7	20.0	52	15	1	1	1	1	1	1	0	0	0	2	0	0	0	0	2	10	0	1	0	0	1	0	0	0	0
17	1	1	155.1	58.0	24.1	50	12	3	3	3	1	1	1	1	1	0	2	1	0	0	0	2	18	1	0	0	0	0	0	1	0	0
18	1	1	156.9	50.2	20.4	50	15	1	1	1	1	1	0	0	0	0	2	0	0	0	0	1	11	0	1	0	0	1	0	0	0	0

19	1	1	150.2	51.0	22.6	45	13	2	2	1	3	0	1	1	0	0	2	0	0	0	0	2	15	1	0	0	0	1	0	0	0	0
20	1	1	161.1	53.2	20.5	48	15	1	1	1	1	1	0	0	0	0	2	0	0	0	0	2	11	0	1	0	0	1	0	0	0	0
21	1	1	159.5	59.3	23.3	51	13	2	2	2	3	1	1	0	0	0	2	0	0	0	0	2	16	1	0	0	0	0	0	1	0	0
22	1	1	152.7	45.9	19.7	47	15	1	1	1	2	0	0	0	0	0	1	0	0	1	0	1	9	0	1	0	0	1	0	0	0	0
23	1	1	158.6	60.9	24.2	52	12	3	3	3	3	1	1	1	0	0	2	0	1	0	0	1	19	0	0	1	0	0	0	1	0	0
24	1	1	151.7	52.7	22.9	52	13	2	2	3	1	0	1	0	1	1	1	0	1	0	0	1	15	1	0	0	0	1	0	0	0	0
25	1	1	151.2	49.4	21.6	52	14	2	2	2	2	0	0	0	0	0	2	0	0	0	0	1	14	1	0	0	0	1	0	0	0	0
26	1	1	168.1	69.8	24.7	48	12	3	3	3	3	1	1	1	1	0	0	0	0	0	1	1	20	0	0	1	0	0	0	1	0	0
27	1	1	157.7	50.5	20.3	50	15	1	1	2	2	0	1	0	0	0	2	0	0	0	0	1	11	0	1	0	0	1	0	0	0	0
28	1	1	150.4	56.3	24.9	51	11	3	3	3	3	1	1	1	1	0	0	1	0	0	1	2	21	0	0	0	1	0	0	0	1	0
29	1	1	158.6	52.6	20.9	51	14	1	1	1	2	0	0	0	0	0	2	0	0	0	0	1	12	0	1	0	0	1	0	0	0	0
30	1	1	165.1	54.3	19.9	48	15	1	1	1	1	1	0	0	0	0	2	0	0	0	0	1	10	0	1	0	0	1	0	0	0	0
31	1	1	157.7	55.7	22.4	47	13	2	2	2	2	0	0	0	0	0	2	0	0	0	0	1	15	1	0	0	0	1	0	0	0	0
32	2	3	156.8	74.2	30.2	44	15	1	2	1	2	0	0	0	0	0	2	0	0	0	0	2	14	1	0	0	0	1	0	0	0	0
33	2	2	151.2	61.2	26.8	51	14	2	2	2	3	0	0	0	0	0	1	0	0	1	0	2	14	1	0	0	0	1	0	0	0	0
34	2	3	152.2	74.1	32.0	54	13	2	2	1	1	0	0	0	0	1	2	1	0	0	0	1	18	1	0	0	0	0	0	1	0	0
35	2	2	165.0	77.9	28.6	51	13	3	2	3	3	1	1	1	0	1	2	1	0	0	1	1	18	1	0	0	0	0	0	1	0	0
36	2	2	166.4	80.0	28.9	53	12	3	2	2	2	1	1	1	0	1	2	1	1	0	0	1	20	0	0	1	0	0	0	1	0	0
37	2	3	151.0	74.6	32.7	49	13	2	2	2	3	0	0	0	0	1	0	1	0	0	1	2	18	1	0	0	0	0	0	1	0	0
38	2	3	159.9	97.4	38.1	50	11	3	3	3	3	1	1	1	1	1	0	1	1	1	1	2	28	0	0	0	1	0	0	0	0	1
39	2	2	151.5	62.6	27.3	52	14	2	2	1	1	0	0	0	0	1	2	1	1	0	0	2	15	1	0	0	0	1	0	0	0	0
40	2	3	168.4	101.3	35.7	49	12	3	3	3	3	1	0	0	0	0	0	0	0	0	1	2	23	0	0	0	1	0	0	0	1	0
41	2	2	169.2	81.3	28.4	48	13	3	2	3	1	1	1	1	0	0	2	0	1	0	0	2	17	1	0	0	0	0	1	0	0	0
42	2	2	168.7	77.9	27.4	50	13	2	2	2	2	0	1	0	1	1	2	1	0	0	0	1	16	1	0	0	0	0	1	0	0	0
43	2	3	163.8	103.0	38.4	48	11	3	3	3	3	1	1	1	1	1	0	1	0	1	1	2	29	0	0	0	1	0	0	0	0	1
44	2	3	158.5	77.4	30.8	48	15	1	1	2	2	0	0	0	0	0	1	0	0	1	1	1	15	1	0	0	0	1	0	0	0	0
45	2	2	152.4	61.6	26.5	52	15	1	1	1	1	1	0	1	0	1	2	0	1	0	0	1	12	0	1	0	0	1	0	0	0	0

46	2	3	151.7	79.6	34.6	51	12	3	2	3	3	1	1	1	1	0	0	0	0	1	0	2	21	0	0	0	1	0	0	0	1	0
47	2	3	151.1	72.2	31.6	51	14	2	2	2	2	0	0	0	1	1	1	1	1	0	1	2	17	1	0	0	0	0	1	0	0	0
48	2	3	162.7	95.1	35.9	52	12	3	3	3	3	1	1	1	0	1	1	1	0	1	1	1	24	0	0	0	1	0	0	0	1	0
49	2	2	154.8	69.9	29.2	48	12	3	3	3	3	1	1	1	0	1	0	0	0	1	0	2	21	0	0	0	1	0	0	0	1	0
50	2	3	166.3	91.0	32.9	48	13	2	2	1	1	1	0	1	0	0	2	0	0	1	0	2	19	0	0	1	0	0	0	1	0	0
51	2	3	163.3	97.8	36.7	46	12	3	3	3	3	1	1	1	1	0	1	0	0	1	1	2	25	0	0	0	1	0	0	0	1	0
52	2	2	154.6	63.6	26.6	51	15	1	1	2	2	0	0	0	0	1	2	1	0	0	0	1	13	0	1	0	0	1	0	0	0	0
53	2	3	156.6	77.3	31.5	51	14	2	1	2	2	0	1	0	0	1	2	1	0	0	0	1	17	1	0	0	0	0	1	0	0	0
54	2	3	156.9	91.6	37.2	47	11	3	3	3	3	1	1	1	0	1	0	0	0	1	0	2	26	0	0	0	1	0	0	0	1	0
55	2	2	168.1	83.4	29.5	47	11	3	3	3	3	1	1	0	1	0	2	0	0	0	0	2	23	0	0	0	1	0	0	0	1	0
56	2	3	162.4	90.8	34.4	48	13	3	2	3	3	1	1	1	0	1	2	0	0	0	1	1	20	0	0	1	0	0	0	1	0	0
57	2	2	158.0	73.9	29.6	51	11	3	3	3	3	1	1	1	1	0	0	0	1	1	1	1	24	0	0	0	1	0	0	0	0	1
58	2	3	155.2	84.3	35.0	49	12	3	2	3	3	1	1	1	0	1	2	1	0	1	0	1	22	0	0	0	1	0	0	0	1	0
59	2	2	162.3	75.6	28.7	51	12	3	2	3	3	1	1	1	1	1	2	1	1	0	0	2	19	0	0	1	0	0	0	1	0	0
60	2	3	154.5	89.8	37.6	49	11	3	3	3	3	1	1	1	1	0	0	0	1	0	1	1	27	0	0	0	1	0	0	0	0	1
61	2	3	161.3	87.1	33.5	51	13	2	2	2	2	1	0	1	1	1	2	1	0	1	0	2	20	0	0	1	0	0	0	1	0	0
62	2	3	153.8	73.6	31.1	49	14	1	2	1	1	1	0	1	0	1	2	0	1	0	1	2	16	1	0	0	0	0	1	0	0	0

KEY TO MASTER CHART

Value		Label
Group	**1**	Controls
	2	Cases
Subgroups	**1**	Normal
	2	Overweight
	3	Obese
Frequency	**1**	Normal
	2	Infrequent
	3	Frequent
Regularity	**1**	Regular
	2	Irregular
	3	Prolonged
Duration	**1**	Normal
	2	Shortened
	3	Prolonged
Volume	**1**	Normal
	2	Light
	3	Heavy
Dysmenorrhea	**0**	No
	1	Yes
Associated clots	**0**	No
	1	Yes
Abdominal pain	**0**	No
	1	Yes
Urinary symptoms	**0**	No
	1	Yes
White discharge	**0**	No
	1	Yes
Parity	**0**	Nulli
	1	Primi
	2	Multi
DM	**0**	No
	1	Yes
HTN	**0**	No
	1	Yes

Hypothyroidism	**0**	No
	1	Yes
OCPills	**0**	No
	1	Yes
Diet	**1**	Veg
	2	Mixed
Secretory phase	**0**	No
	1	Yes
Proliferative phase	**0**	No
	1	Yes
Biphasic	**0**	No
	1	Yes
Disordered proliferative phase	**0**	No
	1	Yes
Simple hyperplasia without atypia	**0**	No
	1	Yes
Simple hyperplasia with atypia	**0**	No
	1	Yes
Complex hyperplasia without atypia	**0**	No
	1	Yes
Complex hyperplasia with atypia	**0**	No
	1	Yes
CA Endometrium	**0**	No
	1	Yes