

(RESEARCH ARTICLE)



## Prevalence of teenage uterine fibroid: The radiologic perspective

E. D. ROBINSON <sup>1,\*</sup>, C. Wekhe, <sup>1</sup> and P. Wilson <sup>2</sup>

<sup>1</sup> Department of Radiology, Rivers State University Teaching Hospital.

<sup>2</sup> St Clarex Intensive Medical Services.

Magna Scientia Advanced Research and Reviews, 2025, 13(01), 129-136

Publication history: Received on 09 December 2024; revised on 19 January 2025; accepted on 21 January 2025

Article DOI: <https://doi.org/10.30574/msarr.2025.13.1.0018>

### Abstract

**Background:** Uterine fibroids are the most common benign neoplasms among women but are rare and less seen before puberty.

**Objective:** This study is to evaluate the prevalence of teenage uterine fibroids using radiologic imaging.

**Materials and Method:** It was a cross-sectional study among 1225 teenage girls over a 12-month period. Participation was voluntary with patients' confidentiality maintained. Ethical approval from the ethics committee was also obtained from participants, or guidance before the study. Age, clinical presentation, and provisional diagnosis were obtained from the referral form while the weight and height were measured before the pelvic ultrasonography. A full bladder was obtained by requesting the participants to take about 500 ml of water before the scan using a 3.5 MHz curvilinear probe coupled into a GE LOGIQ 5 ultrasound machine. Each participant lay supine on the examination couch in the presence of a chaperone. An ultrasound acoustic gel was applied on the skin of the exposed body region to obliterate the air interface between the skin and the transducer. The findings were documented, collated, and analyzed with descriptive statistics using IBM SPSS version 23.0 statistical software for Windows, and results were presented as tables, charts, and figures.

**Results:** The age distribution of the participants was 12 years (8.65%; n = 106), 13 years (15.27%; n = 187), and 16 years (23.35%; n = 286). The highest frequency of uterine leiomyoma was seen among those within the 85th to 94th percentile of BMI. Uterine fibroids were seen at ages 13, 14, and 15 years, accounting for 0.58% (n=22) of the participants. Other findings were PID (7.75%, n=106), UTI (7.52%, n=10), and ovarian cyst (1.50%, n=12).

**Conclusion:** The study also concludes that uterine fibroids can be seen among teenagers aged 13 to 15 years with a point prevalence of 1.8%. Also conclude that the disease is commoner among overweight teenagers.

**Keywords:** Uterine Fibroid; Teenage Uterine Fibroid; Teenage Ovarian Cyst; Ultrasonography

### 1. Introduction

Uterine fibroid is one of the most common benign tumour in women, affecting African women descent of child bearing age. It arises from the uterine muscle (myometrium) with a documented prevalence of 25% [1].

A hospital-based study in Nigeria showed a prevalence of 9.8%, 8.3%, and 6.58% in Lokoja, Zaria, and Ile-Ife, respectively [2]. However, the prevalence of disease in Nigeria is unknown.

\* Corresponding author: E. D. ROBINSON.

The disease is more common among women having fertility difficulty and those that have not been pregnant before [1, 2]. The lesion is rare and less seen before puberty and post-menopausal ages [1, 2]. The lesion varies in size and can be seen either within, outside, or both within and outside a uterus. The mass can also be single or multiple [3, 4]. Over a given duration, the lesion can undergo degenerative changes when the size of the mass outgrows the vascular supply [2, 3, 4]. There are different forms of degenerative changes associated with uterine fibroids. The commonest forms of the uterine degenerative changes are red degeneration or calcification, hyaline degeneration (60%), and myxoid degeneration (50%), while cystic degeneration accounts for about 5% of cases [3, 4]. Because the disease is rare in teens and prepubertal age, these degenerative changes are also very rare in their age group. The clinical presentation of the disease is related to the size, location (whether intramural, subserosal, or submucosal), and the multiplicity of the mass. However, the disease may present with irregular bleeding *per vaginam*, lower abdominal pain, and intraabdominal mass [2, 3, 4].

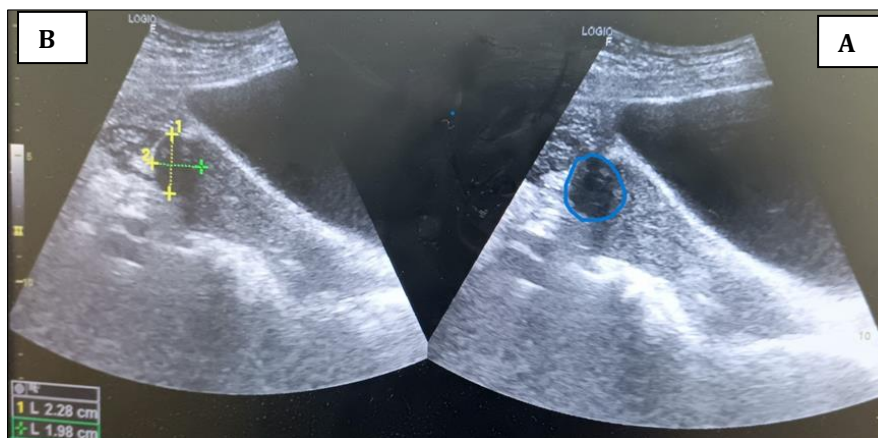
Concerning the position of the mass, uterine fibroids can be seen within the endometrium (submucosal), within the myometrium (intramural), or outside the uterus (subserosal). The fibroid seen within the myometrium (intramural) is the most common location, whereas the submucosal location is the least common position. The disease can co-exist with ovarian cysts, endometriosis, and pelvic inflammatory disease [2, 3, 4].

Radiologically, plain radiography, computed tomography, and fluoroscopy (hysterosalpingography) can be used to evaluate the mass [3]. These aforementioned imaging modalities use ionizing radiation. The other modalities used to investigate uterine fibroids that do not use ionizing radiation are ultrasonography and magnetic resonance imaging [1, 3, 4]. Ultrasonography is the most commonly used modality to diagnose and monitor treatment of uterine fibroids [3]. This imaging modality (ultrasonography) is relatively cheaper and more available when compared to computed tomography and magnetic resonance imaging. In addition, it does not use ionizing radiation; therefore, it is safer than other imaging modalities.

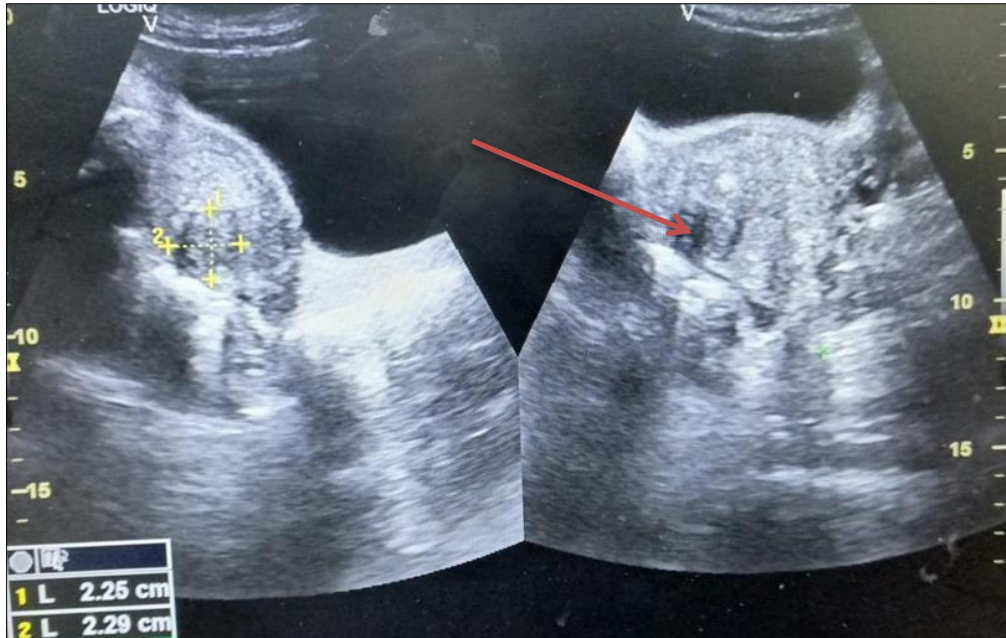
Ultrasonographically, the lesion appears as a well-margined, rounded, or lobulated mass that is predominately hypoechoic in echogenicity, having varying sizes. Figure 1. It could also show varying degrees of homogeneity [3] as shown in Figures 1 and 2.

It could also appear as a mass with a highly echogenic rim or area with posterior acoustic shadowing due to degenerative changes such as calcifications [2, 3, 4]. Surgical intervention (myomectomy) is the treatment modality of choice, and hysterectomy, which is the removal of the uterus, is performed when the lesion becomes very massive and life threatening. However, focal endometrial curettage, uterine artery embolization (UAE), and hormone therapy are also treatment options that are employed depending on the age of the patient, parity, and the presence or absence of comorbidities.

The teenage age is the age between 12 and 17 years, which is the period of self-realization and the definition of goals and priorities. This is the age where the individual gains more sense of belonging. At this age the individual becomes more vulnerable to health-related issues around them, although diseases like uterine fibroids are rare among them.



**Figure 1** Grey scale images of the uterus showing hypoechoic solid fundal mass (area verged blue on image A) measuring approximately 2.28cmX1.98cm (image B) on a 13 years old teenager



**Figure 2** Grey scale images of the uterus showing echocomplex solid mass (see red arrow) measuring approximately 2.29 cm X 2.26 cm on a 14 years old teenager

Uterine fibroids are usually seen in women of childbearing age (from puberty to before menopause) [1]. It is rare in children and before pubertal age, although a case has been reported in a teenager aged 16 years [5] who presented with severe anemia and abnormal uterine bleeding. According to the report, pelvic magnetic resonance imaging (MRI) was used to demonstrate the mass within the uterus. Another case of teenage uterine fibroid was also seen in a 15-year-old girl and was also reported by Salehi et al. [6], while another case of the lesion was seen in a 13-year-old teenager [7].

According to epidemiologic data, uterine fibroid is a disease of Black women that is associated with nulliparity among women of childbearing age [1-4]. Cases of uterine fibroids have been documented to be diagnosed among adolescents and teenagers; it is therefore imperative to evaluate the prevalence of the disease among teenagers in this environment. The results from this study will necessitate close attention to teenage uterine fibroids when evaluating the teenage pelvis for related symptoms.

## 2. Materials and method

It is a cross-sectional descriptive study carried out among 1225 teenage girls who were sent for ultrasonography over a period of 12 months. Participation in the study was absolutely voluntary, and a high level of confidentiality was maintained during the study. Ethical approval was obtained before the commencement of the study from the Health Research and Ethics Committee. A written consent was also obtained from each participant, guidance, or guarantor before inclusion in the study. The participant's age, clinical presentation, and provisional diagnosis were obtained from the referral form, while the weight and height were measured before the pelvic ultrasonography.

All teenage girls referred for an abdominopelvic ultrasound scan who accepted to participate in the study were included, while patients with a clinical diagnosis of acute abdomen or severe abdominal pain were also excluded from the study.

The ultrasound scan was done with a 3.5 MHz curvilinear probe coupled into a GE LOGIQ 5 ultrasound machine. Before the scan, a full bladder was obtained by requesting the participants to first take about 500 mL of water in order to attain a full urinary bladder. A full urinary bladder is required to serve as an acoustic window for proper visualization of the pelvic contents.

The ultrasound scan was done for each participant in a supine position on the examination couch in the presence of a chaperone with the participants' lower abdomen exposed from the xiphisternum to the pubis symphysis.

In order to adequately evaluate and demonstrate the area investigated, an ultrasound acoustic gel was applied on the skin of the exposed body region to obliterate the air interface between the skin and the transducer. The area of interest

is evaluated in both the longitudinal and transverse planes. At the end of the scan, the findings were documented, collated, and analyzed with descriptive statistics using IBM SPSS version 23.0 statistical software for Windows, and results were presented as tables, charts, and figures.

### 3. Results

One thousand, one hundred, and twenty-five teenage girls participated in the study. As demonstrated in Table 1, the age distribution of the participants shows that 8.65% (n=106) were aged 12 years while 15.27% (n=187) of the participants were aged 13 years. Those aged 16 years were the most frequent age group, accounting for approximately 23.35% (n = 286) of the total participants (Table 1).

The BMI classification of participants revealed that 11 persons aged 12 years had a BMI < 5th percentile, while 15 persons aged 17 years had similar BMI according to figure 3. The figure also revealed that 89, 197, and 252 participants had a BMI of 5th to 84th percentile for 12 years, 15 years, and 16 years, respectively. Whereas 22 participants aged 16 years had a BMI of 85th to 94th percentile while 4 persons aged 13 years are within the 95th to 99th percentile (Figure 3).

It was illustrated in Figure 4 that 3 participants with normal BMI (5th to 84th percentile) had uterine leiomyoma, while those within the 85th to 94th percentile of BMI had the highest frequency of the lesion, accounting for 12 cases out of the 22 cases, whereas 7 cases were seen among those with 95th to 99th percentile of BMI. These suggest that the disease was more common among those that were overweight.

As shown in Table 2, the most frequent presenting complaint among the participants was lower abdominal pain, accounting for 38.29% (n=469), followed by generalized abdominal discomfort, which accounted for 18.69% (n=229). The other presenting complaints were dysmenorrhea (n=202; 16.49%), dysuria (n=48; 3.92%), and irregular vaginal bleeding (n=87; 7.10%), among others (Table 2).

Table 3 illustrated the provisional diagnosis for requesting the investigation, which showed UTI (n=48; 3.92%), PID (n=469; 38.29%), early pregnancy (n=29; 10.53%), and menorrhagia (n=24; 1.96%). Improperly filled investigation forms without provisional diagnosis accounted for 18.69% (n=229), as also shown on Table 3.

The sonographic findings showed normal study accounting for 82.20% (n=981) of the participants, while uterine leiomyoma was seen in 0.58% (n=22) of the participants (Table 4). Other findings include pelvic inflammatory disease (7.75% n=106), UTI (7.52%; n=10), and ovarian cyst on 1.50% (n=12) of the participants (Table 4). The findings revealed that two cases of uterine fibroids were seen in 15-year-old teenagers, while a 13-year-old was also diagnosed, and 3 cases were seen in 14-year-old teenagers. Thus, the result shows a point prevalence of 1.8% of uterine fibroids among teenagers.

**Table 1** Age distribution of respondents

Age (years)	Frequency	Percentage
12	106	8.65%
13	187	15.27%
14	217	17.71%
15	220	17.96%
16	286	23.35%
17	209	17.06%
Total	1225	100

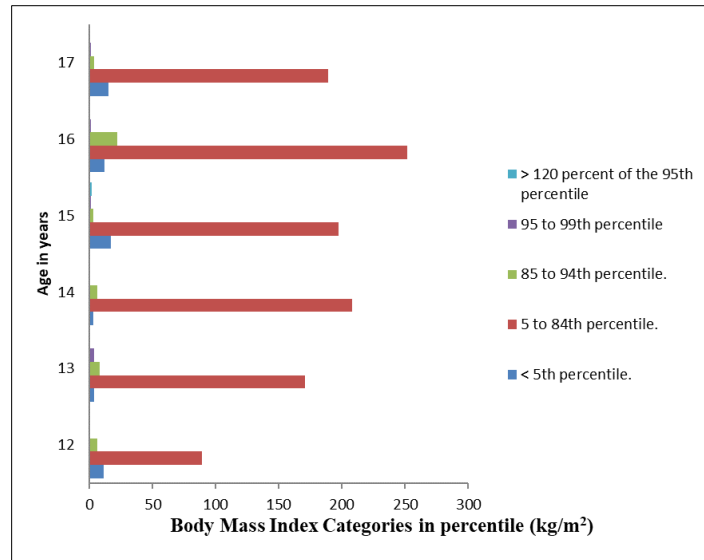


Figure 3 BMI distributions of participants

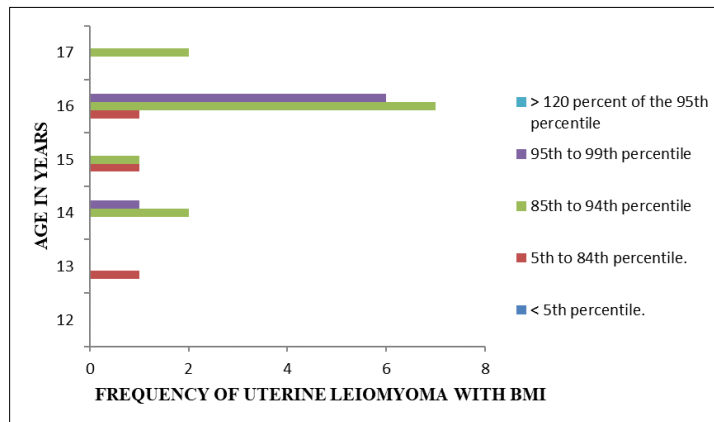


Figure 4 BMI distribution with uterine fibroid

Table 2 Clinical presentation of participants

Variables	No. of Respondents	Percentage
Irregular Vaginal bleeding	87	7.10%
Dysuria	48	3.92%
Dysmenorrhea	202	16.49%
Lower abdominal pain	469	38.29%
Nausea and vomiting	129	10.53
Generalized abdominal discomfort	229	18.69%
Amenorrhea	24	1.96%
Diarrhea	37	3.02%
Total	1225	100.00%

**Table 3** Provisional diagnosis of participants

Variables	No. of Respondents	Percentage
UTI	48	3.92%
PID	469	38.29%
Menorrhagia	24	1.96%
Dysmenorrhea	202	16.49%
Early pregnancy	29	10.53%
No diagnosis	229	18.69%
Abortion/Miscarriage	87	7.10%
Total	1225	100.00%

**Table 4** Ultrasonographic findings of participants

Variables	Age (in years)						Frequency	Percentage
	12	13	14	15	16	17		
UTI	9	21	15	9	5	42	101	7.52%
Normal	96	153	181	184	222	145	981	82.20%
PID	1	12	18	21	43	11	106	7.75%
Ovarian Cyst	-	-	-	4	1	7	12	1.50%
Pregnancy	-	-	-	-	1	2	3	0.46%
Uterine Leiomyoma	-	1	3	2	14	2	22	0.58%
Total	106	187	217	220	286	209	1225	100%

Pelvic Inflammatory Disease (PID), Urinary Tract Infection (UTI)

#### 4. Discussion

The study evaluated the prevalence of teenage uterine fibroids among 1225 teenage girls in our environs. Out of 1225 teenage girls who participated in the study, 8.65% (n=106) were aged 12 years, 15.27% (n=187) were aged 13 years, while participants aged 16 years were the most frequent age, accounting for 23.35% (n=286) of the total participants. According to the Centers for Disease Control and Prevention publication [8, 9], Body Mass Index Categories classification for children ages 2 to 20 was adopted. This BMI categorization for children and teens is a sex- and age-specific BMI percentiles classification and not only based on height and weight as in adult BMI evaluation. This method categorized the BMI into the following: underweight (< 5th percentile), normal weight (5th to 84th percentile), overweight (85th to 94th percentile), obesity (95th to 99th percentile or BMI > 30), and severe obesity (> 120 percent of the 95th percentile or BMI > 35 kg/m<sup>2</sup>). The result shows that 11 participants aged 12 years had a BMI <5th percentile, while 89, 197, and 252 participants had a BMI of 5th to 84th percentile for 12 years, 15 years, and 16 years, respectively. Twenty-two participants aged 16 years were overweight with a BMI of 85th to 94th percentile, and 4 participants aged 13 years were obsessed with a BMI within the 95th to 99th percentile.

Uterine leiomyoma was seen in 3 participants having normal BMI (5th to 84th percentile), while 12 cases out of the 22 cases were seen among the overweight participants with BMI within the 85th to 94th percentile, whereas 7 cases were seen among those with 95th to 99th percentile of BMI. These findings suggest that the disease is more common among those that are overweight. This finding was in consonance with the study by Shikora et al. [10], where it was suggested that symptomatic uterine fibroids may be associated with obesity, notwithstanding their study was among adult subjects.

Another study by Qin et al. [11] to evaluate the association between obesity and the risk of uterine fibroids: a systematic review and meta-analysis from a literature search from 1 January 1992 to 30 May 2020 involving 325,899 participants and 19,593 cases showed that obesity may increase the risk/prevalence of uterine fibroids in a non-linear fashion. This finding was also similar to that of Sharami et al. [12].

The result showed that the most frequent presenting complaint was lower abdominal pain, which accounted for 38.29% (n=469), followed by generalized abdominal discomfort (18.69%; n=229), dysmenorrhea (n=202; 16.49%), dysuria (n=48; 3.92%), and irregular vaginal bleeding (n=87; 7.10%). Contrary to the findings in the present study, it is documented that 50% of afflicted patients are asymptomatic [13]. Another study showed that the commonest mode of clinical presentation was a lower abdominal mass and recurrent abortions [14]. These contrary views were seen in studies involving adult subjects instead of teenagers as contained in the present study.

The investigation's findings showed uterine fibroids in 13-year-old, 14-year-old, and 15-year-old teenagers, with a point prevalence of uterine fibroids among teenagers as 1.8%. Notwithstanding available literature showing that uterine fibroids are a rare disease among teenagers, some cases have been documented sparingly. Teenage uterine fibroid was documented in a 13-year-old teenager by Morita et al. [15]. Similar teenage uterine leiomyomas were also seen in 16- and 19-year-old teenagers by Zigman et al. [16] and Gong et al. [17], respectively. Normal sonographic findings were seen in the majority of the participants (82.20%; n = 981). Other findings were ovarian cysts (1.50%; n=12), pelvic inflammatory disease (7.75%; n=106), and UTIs (7.52%; n=10). According to Birbas et al. [18], ovarian lesions such as ovarian cysts can be seen in children and adolescents [18]. Available data shows that the incidence of ovarian lesions is higher in girls over 12–14 years of age and increases with age. A well-delimited giant cystic lesion requiring surgery was seen in a 14-year-old teenager [19].

The study was encumbered with birth date certification as the majority of the participant's birth date could not be ascertained. However, parental and guidance testimonials, as well as academic records, were used in some cases.

#### *Study limitations*

The study was encumbered with birth date certification and verification. The majority of the participant's birth date could not be verified. However, parental and guidance testimonials, as well as academic records, were used to authenticate the age of the participants.

---

## **5. Conclusion**

The prevalence of teenage uterine fibroids using ultrasonography was evaluated with 1225 teenage participants. The study noted the diagnosis of uterine fibroid among teenagers aged 13, 14, and 15 years with a point prevalence of 1.8% among teenagers. The study also concludes that the disease was more common among overweight participants.

#### *Author's contributions*

All authors were involved in the conceptualization, design, reviews of relevant literatures, data collection, and analyses of the data collected. All authors prepared the final draft of the manuscript and agreed on the final draft. All authors are responsible for the scientific content and integrity of the manuscript.

---

## **Compliance with ethical standards**

#### *Disclosure of conflict of interest*

There is no conflict of interest or competing Interests concerning this manuscript.

#### *Statement of informed consent*

Informed consent was obtained from each participant before the commencement of the study.

#### *Ethical statement*

Ethical approval was obtained before commencement of the study from the Health Research and Ethics Committee with RSUTH/REC/22/114. reference number

## References

- [1] Farooq S, Leong Y, Knipe H, et al. Uterine leiomyoma. Reference article, Radiopaedia.org (Accessed on 13 Mar 2023) <https://doi.org/10.53347/rID-10915>
- [2] Ijeruh O.Y, Robinson E.D, Alazigha1 N, Lawson A M and Wekhe C. Radiologic Pattern of Uterine Leiomyoma among Rural Women Undergoing Routine Pelvic Ultrasonography in South-South Nigeria . African Journal of Health Sciences Volume 34, Issue No. 2, March – April 2021
- [3] Fasubaa OB, Sowemimo OO, Ayegbusi OE, Abdur-Rahim ZF, Idowu BS, Ayobami O, Babalola OE, Akindojutimi AJ.: Contributions of uterine fibroids to infertility at Ile-Ife, South-Western Nigeria. Trop J Obstet Gynaecol 2018; 35:266-70
- [4] Wilde, S., & Scott-Barrett, S.: Radiological appearances of uterine fibroids. The Indian journal of radiology & imaging, 2009; 19(3), 222–231. <https://doi.org/10.4103/0971-3026.54887>
- [5] Murphy CA, Zarudskaya O, Kakish C, Zoorob D, Seo-Patel S. Uterine Fibroid in a 16-Year-Old Adolescent Managed with a Fertility-Sparing Approach: A Case Report and Review of the Literature. J Pediatr Adolesc Gynecol. 2021 Jun;34(3):427-431. doi: 10.1016/j.jpjag.2020.12.016. Epub 2021 Feb 13. PMID: 33359317.
- [6] Salehi PP, Tyson N. Laparoscopic Myomectomy of a Symptomatic Uterine Leiomyoma in a 15-Year-Old Adolescent. J Pediatr Adolesc Gynecol. 2016 Dec;29(6):e87-e90. doi: 10.1016/j.jpjag.2016.05.007. Epub 2016 Jun 2. PMID: 27262836.
- [7] Robinson ED, Wekhe C, Ebere J, Wilson P. Knowledge and perception of uterine fibroid among teenage girls with routine pelvic ultrasonographic evaluation of teenagers. Hell J Radiol 2023; 8(3): 24-35.
- [8] Centers for Disease Control and Prevention Body mass index (BMI), Available at: <https://www.cdc.gov/healthyweight/assessing/bmi/index.html>. Accessed November 5, 2023
- [9] Centers for Disease Control and Prevention Overweight & Obesity. Available <https://www.cdc.gov/obesity/basics/childhood-defining.html>
- [10] Shikora SA, Niloff JM, Bistran BR, Forse RA, Blackburn GL. Relationship between obesity and uterine leiomyomata. Nutrition. 1991 Jul-Aug;7(4):251-5. PMID: 1802214.
- [11] Qin H, Lin Z, Vásquez E, Luan X, Guo F, Xu L. Association between obesity and the risk of uterine fibroids: a systematic review and meta-analysis. J Epidemiol Community Health. 2021 Feb;75(2):197-204. doi: 10.1136/jech-2019-213364. Epub 2020 Oct 16. PMID: 33067250.
- [12] Sharami SH, Fallah Arzpeyma S, Shakiba M, Montazeri S, Milani F, Kazemi S, Dalil Heirati SF. Relationship of Uterine Fibroids with Lipid Profile, Anthropometric Characteristics, Subcutaneous and Preperitoneal Fat Thickness. Arch Iran Med. 2019 Dec 1;22(12):716-721. PMID: 31823623.
- [13] Gupta S, Jose J, Manyonda I. Clinical presentation of fibroids. Best Pract Res Clin Obstet Gynaecol. 2008 Aug;22(4):615-26. doi: 10.1016/j.bpobgyn.2008.01.008. Epub 2008 Mar 26. PMID: 18372219.
- [14] Ezeama C, Ikechebelu J, Obiechina Nj, Ezeama N. Clinical Presentation of Uterine Fibroids in Nnewi, Nigeria: A 5-year Review. Ann Med Health Sci Res. 2012 Jul;2(2):114-8. doi: 10.4103/2141-9248.105656. PMID: 23440007; PMCID: PMC3573503.
- [15] Morita N, Tanaka T, Hashida S, Tsunetoh S, Taniguchi K, Komura K, Ohmichi M. Uterine leiomyoma in a 13-year-old adolescent successfully treated with laparoscopic myomectomy: A case report. Medicine (Baltimore). 2019 Dec;98(49):e18301. doi: 10.1097/MD.00000000000018301. PMID: 31804377; PMCID: PMC6919386
- [16] Zigman JS, Brotherton J, Truong C, Yazdany T. Surgical Planning and Counseling in Adolescence: A Case Report of a 16-Year-Old with an Aborting Pelvic Mass. Gynecol Minim Invasive Ther. 2018;7(4):175-177.
- [17] Gong YY, George V, Appleton J, Guan X, Adeyemi-Fowode O. Single Incision Laparoscopic Surgery for Leiomyoma in the Adolescent Patient: A Case Report. J Pediatr Adolesc Gynecol. 2021;34(4):573-575. doi: 10.1016/j.jpjag.2021.02.103. Epub 2021 Mar 3. PMID: 33675982..)
- [18] Birbas E, Kanavos T, Gkrozou F, Skentou C, Daniilidis A, Vatopoulou A. Ovarian Masses in Children and Adolescents: A Review of the Literature with Emphasis on the Diagnostic Approach. Children (Basel). 2023;10(7):1114. doi: 10.3390/children10071114. PMID: 37508611; PMCID: PMC10377960.
- [19] Tarca E, Trandafir LM, Cojocaru E, Costea CF, Rosu ST, Butnariu LI, Iordache AC, Munteanu V, Luca AC. Diagnosis Difficulties and Minimally Invasive Treatment for Ovarian Masses in Adolescents. Int J Womens Health. 2022; 14:1047-1057 <https://doi.org/10.2147/IJWH.S374444>