Survey of Females at School Age Group Between 10-15 Years Old to Study the Prevalence of Ovarian Cysts Among them Using Pelvic Ultrasound

Thesis

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Contents

Title	Page
List of Abbreviations	ii
List of Tables	iii
List of Figures	iv
List of diagrams	viii
Introduction and Aim of work	1
Review of Literature	3
Chapter 1: Anatomy and physiology of the ovaries	3
Chapter 2: Ovarian cysts	17
Chapter 3: Ultrasonography	41
Chapter 4: Diagnostic work up of cystic ovarian lesions	46
Patients and Methods	54
Results	55
Illustrated Cases	65
Discussion	70
Summary and Conclusion	75
References	77
Arabic Summary	١

List of Abbreviations

CT : Computed Tomography

GCT : Germ Cell Tumor

HOC : Hemorrhagic Ovarian Cyst

Hz : Hertz

LH : Luteinizing Hormone

MR : Magnetic Resonance

mHz : Mega-Hertz

TOA : Tubo-Ovarian Abscess

US : Ultrasonography

List of Table

Table	Page
Table (1): Age (years) distribution of the study group	56
Table (2): Age of start of menstruation (years) distribution of the study group	57
Table (3): Time of last cycle (days) distribution of the study group	58
Table (4): Menstrual pattern distribution in the study group.....	59
Table (5): Pelvic US finding distribution in the study group regarding ovarian cysts	60
Table (6): Size of ovarian cysts distribution in the study group.....	61
Table (7): Comparison between adolescent with and without ovarian cyst in the study group.....	62
Table (8): Relation between ovarian cyst findings and age (years) in the study group.....	63
Table (9): Relation between ovarian cyst incidence and menstrual pattern in the study group	64

List of Figures

Figures	Page
Figure (1): The structures in the lateral pelvic wall of ovarian fossa.....	5
Figure (2): Illustration of the ovary, suspensory ligament, and ovarian vessels	6
Figure (3): Drawing of broad ligament (shaded) in adult female human shown from back (A),and from the side (B).....	7
Figure(4): histological structures of the ovary.....	10
Figure (5): Transvaginal US of a normal ovary	11
Figure (6): Normal postmenopausal ovary	11
Figure (7): Overview of menstrual cycle.....	16
Figure (8): Cystic ovarian masses.....	17
Figure (9): The US-image shows two simple cysts in the right ovary with ovarian stroma in between.....	18
Figure (10): Corpus luteum in a 35-year-old woman	19
Figure (11): Hemorrhagic cysts	21
Figure (12): Transvaginal US of a polycystic ovary.....	22
Figure (13): Transvaginal US with color doppler of an endometrioma ..	23
Figure (14): Transvaginal US of dermoid cyst	24
Figure (15): US images showing benign serous cystadenoma	25
Figure (16): Mucinous cystadenoma	25
Figure (17): Ovarian fibroma in a 68-year-old woman with prior hysterectomy	27
Figure (18): Transvaginal US of a borderline serous cystadenocarcinoma.....	27
Figure (19): Transvaginal US with high definition color of a borderline mucinous cystadenocarcinoma.....	28
Figure (20): Endometrioid carcinoma on a background of	28

Figures	Page

endometriosis .....
Figure (21): Clear cell carcinoma 29
Figure (22): Features of malignancy..... 30
Figure (23): Origin of the three main types of malignant ovarian tumor 30
Figure (24): Transvaginal US of serous cystadenocarcinoma of the ovary 31
Figure (25): Transvaginal US images of a lesion eventually diagnosed as mucinous cancer following surgery 31
Figure (26): Dysgerminoma..... 32
Figure (27): Mature cystic teratoma in a 31-year-old woman with an elevated serum CA-125 level of 384 33
Figure (28): Granulosa cell tumor..... 34
Figure (29): Ovarian metastases 35
Figure (30): Krukenberg tumor..... 36
Figure (31): Incidentally discovered paraovarian cyst in a 23-year-old woman with irregular menses..... 36
Figure (32): Hydrosalpinx in a 46-year-old woman 37
Figure (33): Peritoneal inclusion cyst in a 29-year-old woman 38
Figure (34): Transvaginal US of a TOA..... 39
Figure (35): Transabdominal US images from a 9 year old girl with torsed Left ovary..... 40
Figure (36): A-mode US of fetal head..... 43
Figure (37): An example of a B-mode image 44
Figure (38): Color Doppler mode of blood flow within the ovary..... 44
Figure (39): Illustration of the steps needed for evaluation of cystic ovarian lesions 47
Figure (40): Pie chart: Age distribution of the study group 56
Figure (41): Bar chart: Age of start of menstruation (years) distribution of the study group..... 57

Figures	Page

Figure (42): Bar chart: Last cycle timing (days) distribution of the study group 58
Figure (43): Pie chart: Menstrual pattern distribution of the study group 59
Figure (44): Pie chart: Pelvic US finding distribution in the study group 60
Figure (45): Bar chart: Size of ovarian cysts distribution in the study group 61
Figure (46): Pie chart: Number of adolescent with and without ovarian cyst according findings in the study group 62
Figure (47): Bar chart: Relation between ovarian cyst findings and age (years) in the study group 63
Figure (48): Bar chart: Relation between ovarian cyst incidence and menstrual pattern in the study group 64
Figure (49): Case 1 65
Figure (50): Case 2 66
Figure (51): Case 3 67
Figure (52): Case 4 68
Figure (53): Case 5 69

List of Diagrams

Diagram	Page
Diagram (1): A diagram clarifies criteria of low risk and high risk patients	46
Diagram (2): Diagrammatic illustration of US features and recommendations of simple ovarian cyst	49
Diagram (3): Diagrammatic illustration of US features and recommendations of HOC	50
Diagram (4): Diagrammatic illustration of US features and recommendations of endometrioma	51
Diagram (5): Diagrammatic illustration of US features and recommendations of mature cystic teratoma	51
Diagram (6): Diagrammatic illustration of US features and recommendations of any other cyst with findings indicating possible neoplasm	53

Introduction

The ovaries are paired pelvic organs that lie on either side of the uterus close to the lateral pelvic wall, behind the broad ligament and anterior to the rectum. Throughout infancy and childhood, the ovary enlarges, increases in weight about 30-fold, and changes in shape, so that by the time of puberty it has reached the size, weight, and shape of the adult ovary, and lies within the true pelvis ***(Clement, 2002)*.**

An ovarian cyst is a fluid-filled sac in the ovary. It is a common gynecological problem that are divided into 2 main categories; physiological and pathological. Physiological cysts are follicular cysts and luteal cysts. Pathological cysts are considered as ovarian tumors, which might be benign, malignant, or borderline. Benign tumors are more common in young females, but malignant are more frequent in elderly females ***(Abduljabbar et al., 2015)*.**

In general, the great majority of ovarian cysts are asymptomatic functional (physiological) cysts with simple appearance and small size (1-3 cm), and usually resolve without treatment. Treatment is indicated if the diagnosis is in question, the cyst persists, or the patient is symptomatic ***(Brand and Helmrath, 2005; Emeksiz et al., 2017)*.**

Ovarian cysts may present in many ways including abdominal pain, palpable abdominal mass, nausea, vomiting, increasing abdominal girth, and precocious puberty. In the adolescent population, cysts are likely to be associated with irregular menstrual cycles. In prepubertal females, an ovarian cyst most commonly presents as a palpable abdominal mass ***(Zolton and Maseelall, 2013)*.**

Widespread use and availability of Ultrasonography (US) in pediatric imaging has led to an increase in the number of detected ovarian cysts in children suggesting that they are more common than considered in the pediatric population. The ovary is more active during puberty due to the increased gonadotropin secretion. Hence, finding an ovarian cyst is more common in adolescence than in children. Although ovarian cysts are known to be more common and larger in adolescents compared to other stages of growth as a result of increased gonadotropin stimulation of ovaries during puberty, very limited data exists about the epidemiology and characteristics of ovarian cysts in adolescents. There are only a few studies on the incidence and US findings of ovarian cysts in children and adolescents ***(Emeksiz et al., 2017)*.**

Aim of the work

The aim of the present study is to document ovarian cyst frequency and characteristics in females at school age group between 10-15 years old to study the prevalence and characteristics of ovarian cysts among them. The findings may contribute to the understanding of normal ovarian developmental process and may help improve the management of ovarian cysts in this age group.

Chapter 1
Anatomy and Physiology of the ovaries

The ovaries are paired pelvic organs that lie on either side of the uterus in relation to the lateral wall of the pelvis, and attached to the back of the broad ligament of the uterus, behind and below the uterine tubes ***(Clement, 2002)*.**

Alterations in the ovary induced by Age

Newborn ovary:

The newborn ovary is an elongated structure 1.5 to 2 cm in length, 0.5 cm in width, and 1 to 3.5 mm in thickness, weighing between 0.3 and 0.4 g. Initially it lies in the false pelvis and only later in its growth phase does it move into the true pelvis. The surface is pinkish white and smooth, except for an occasional follicle that may be near the surface ***(Clement, 2002)*.**

Ovary during Adolescence and reproductive period:

There is a growth phase between birth and puberty. Each ovary is about 4 cm in length, 2 cm in width, and about 8 mm in thickness, and weights from 2 to 3.5 gm. The ovaries are of a grayish-pink color, and present either a smooth or a puckered surface. In prepubertal females, the surface of the ovary is covered by a smooth layer of ovarian surface epithelium, a single layer of cuboidal cells that gives the surface a dull, grayish appearance, contrasting with the shiny surface of the adjacent peritoneal mesovarium with which it is continuous. After puberty, the surface becomes progressively scarred and distorted because of the repeated rupture of ovarian follicles and discharge of oocytes that are part of ovulation. The scarring is less in women who have been taking oral contraceptives that inhibit ovulation ***(Drake et al., 2008)*.**

Postmenopausal ovary:

The ovary is now nonfunctioning and small. It may weigh from 1 to 2 g. The outer surface is cerebriform in appearance and the cut surface is essentially fibrotic ***(Clement, 2002)*.**

Relations of the ovary

Each ovary presents a lateral and a medial surface, an anterior or mesovarian and a posterior free border ***(Drake et al., 2008)***.

Anterior border (Mesovarium):

A fold of peritoneum from the posterior leaf of the broad ligament is attached to the anterior border through which the ovarian vessels and nerves enter the hilum of the gland.

Posterior border:

Posterior border is free and is related with tubal ampulla. It is separated by the peritoneum from the ureter and the internal iliac artery.

Medial surface:

It is related to fimbrial part of the tube.

Lateral surface:

The lateral surface is in contact with the ovarian fossa on the lateral pelvic wall ***(Dutta, 2013)*.**

The ovaries lie in a shallow depression, named the ovarian fossa**,** on the lateral wall of the pelvis; this fossa is bounded above by the external iliac vessels, in front by the obliterated umbilical artery, and behind by the ureter. The exact position of the ovary has been the subject of considerable difference of opinion, and the description here given applies to the ovary of the nulliparous

woman. The ovary becomes displaced during the first pregnancy, and probably never again returns to its original position. (Fig. 1) ***(Drake et al., 2008)***.

The ovarian vessels, lymphatics, and nerves pass to and from the superolateral aspect of the ovary within the suspensory ligament of the ovary, which actually constitutes the lateral part of the mesovarium of the broad ligament (Fig. 2) ***(Moore et al., 2006)***.

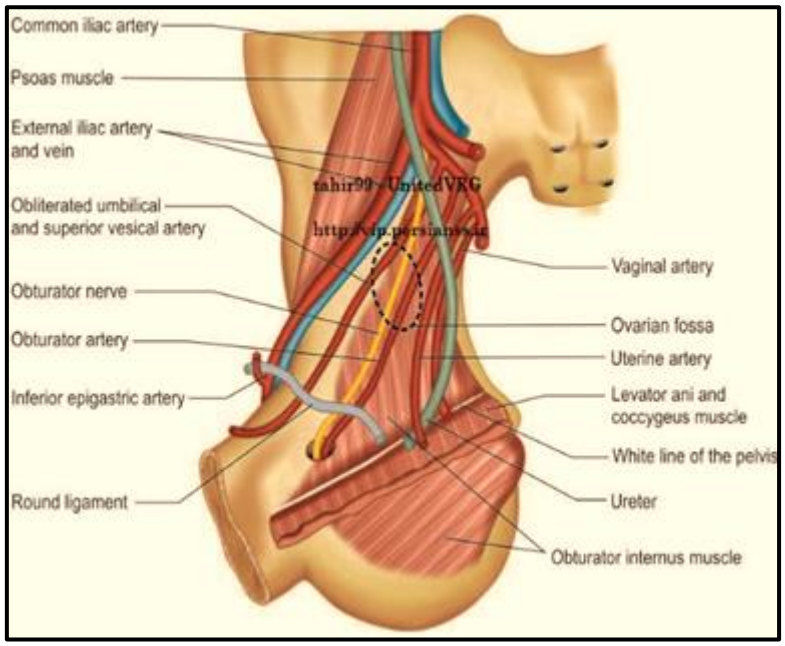

Fig. (1): The structures in the lateral pelvic wall of ovarian fossa *(Dutta, 2013)*.

Ligaments

Suspensory ligament of the ovary:

Infundibulopelvic Ligament (Syn: Suspensory ligament of the ovary):

It includes the portion of the broad ligament which extends from the infundibulum of the Fallopian tube to the lateral pelvic wall. It contains ovarian vessels and nerves and lymphatics from the ovary, Fallopian tube and body of the uterus (Fig. 2) ***(Dutta, 2013)*.**

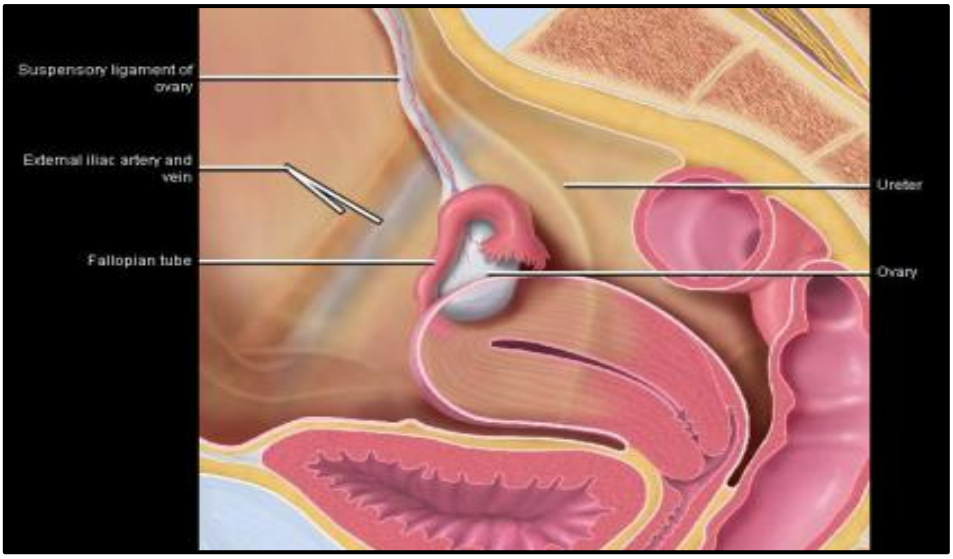

Fig. (2): Illustration of the ovary, suspensory ligament, and ovarian vessels (Moore et al., 2006).

Ovarian ligament:

These are paired, one on each side. Each one is a fibromuscular cord-like structure which attaches to the inner pole of the ovary and to the cornu of the uterus posteriorly below the level of the attachment of the fallopian tube. It lies beneath the posterior leaf of the broad ligament and measures about 2.5 cm in length. It is continuous with the round ligament and together are the homologous to the gubernaculum testis ***(Dutta, 2013)*.**

Broad ligament of the uterus:

The broad ligament is a double fold of peritoneum that extends from the lateral edges of the uterus to the pelvic wall: thus, it is not really a ligament.

The broad ligament and uterus are described as dividing the pelvic cavity into two distinct areas: the recto-uterine pouch, between the uterus and the rectum and parts of the sigmoid colon, and the vesico-uterine pouch between the uterus and the bladder, The Broad ligament itself is composed of three different sections, of differing sizes and significance, according to the structures it is covering **(**Fig. 3) ***(Miller et al., 2004)***.