

## OVARIAN CYSTS IN INFANTS-OUR EXPERIENCE

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### Abstract

Neonatal ovarian cysts (NOC) are being diagnosed more often now that routine ultrasonography is carried out antenatally and postnatally. A truly cystic abdominal mass in a newborn is most likely to be an ovarian cyst, although duplication cyst or mesenteric cyst should be considered in the differential diagnosis. There is controversy about the best treatment for these cysts, opinions ranging from oophorectomy to follow-up by ultrasonography alone. Material and methods: A retrospective study of patients with NOC, out of 73 asymptomatic female infants that underwent abdominal ultrasonography as part of a screening, in the Neonatal Ward of the Emergency Hospital for Children Timisoara “Louis Turcanu” between July 2013 – July 2014. Size and localization of the cyst, as well as age at which they were detected and the possible maternal etiologic factors were recorded. Results: 33 (45.20%) infants were diagnosed with NOC according to echographic criteria, out of 73 female infants that were evaluated. The majority of the cysts were unilateral and detected in the right ovary in 23 (69.7%) of patients. All cysts were small; mean size of the cysts was  $15.0 \pm 5.0$  mm (range 10mm and 30mm). No complications were noted (torsion, haemorrhage, peritonitis, bowel obstruction or respiratory distress). Periodic ultrasound examinations revealed a tendency towards spontaneous regression of this cysts. Most of the cases resolved spontaneously by the age of one year. Conclusions: Ovarian cysts are seen more frequently than expected in the neonatal period. Ovarian cysts are the rule, not the exception in newborn infants.

**Key words:** ovarian cysts, infancy

### Introduction

Neonatal ovarian cysts (NOC) are the most common type of benign tumors found in female newborns [1]. A case of NOC was first mention in literature in 1889 as an autopsy finding in a stillborn preterm infant. In 1942 Bulfamonte reported the first case of an ovarian cyst successfully treated during the newborn period [2]. Nowadays, the routine use of ultrasound allows the detection of NOC during the neonatal period. NOC with a diameter exceeding 2 cm are considered pathological. The incidence of ovarian cysts has been

estimated at more than 30% (this estimate is based on an investigation of stillborns or infants who died within 28 days of birth) [3]. The correlation of the diameter with the clinical symptoms and ultrasound appearance allows an optimal therapeutic approach [4].

The etiology of NOC remains unknown, but hormonal stimulation, advanced gestational age and increasing placental chorionic gonadotropin levels in complicated pregnancies with large placenta such as in diabetes, pre-eclampsia and Rh incompatibility are the most frequently mentioned assumptions [5,6,7]. Additionally, fetal hypothyroidism and congenital adrenal hyperplasia due to 21-hydroxylase deficiency or 11 beta-hydroxylase deficiency have also been reported to cause NOC.[1,17] NOC are classified according to their ultrasonographic features as “simple” or “complex”, and according to their size as “small” or “large” cysts [8,9]. Most cysts are functional in origin and histologically simple and benign [10]. Complications that can occur include intracystic hemorrhage, rupture with possible intraabdominal hemorrhage, gastrointestinal or urinary tract obstruction, ovarian torsion and necrosis, incarcerated inguinal hernia, dystocia by excess of fetal abdominal part, and respiratory distress at birth from a mass effect on the diaphragm [11,12].

Spontaneous regression of both simple and complex cysts often occurs by six months of age, as the hormone concentrations fall and the stimulus for growth disappears, therefore management is usually expectant. The rate of malignancy is so low that it need not be considered in making therapeutic decisions. [13]

### Material and method

Retrospective study of patients with NOC, out of 73 asymptomatic female infants that underwent abdominal ultrasonography as part of a screening, in the Neonatal Ward of the Emergency Hospital for Children Timisoara “Louis Turcanu” between July 2013 – July 2014. Size and localization of the cyst, as well as age at which they were detected and the possible maternal etiologic factors were recorded.

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The cysts were classified according to their size as "small" for cysts with diameter < 4 cm, and "large" for those > 4 cm. The Nussbaum criteria were used for discrimination between simple and complex cysts. When completely anechoic and with a thin wall, the cyst was defined simple [14]. Cysts, which presented themselves echogenic, with a fluid-debris level, a retraction clot or a septation were defined complex. Patients were followed-up with serial ultrasound examinations.

### Results

33 (45.20%) infants were diagnosed with NOC according to echographic criteria, out of 73 female infants that were evaluated.

There was history of pre-eclampsia in 3 mothers and gestational diabetes in one. Rh incompatibility without

hydrops was noted in two patients. Thyroid function tests were within normal ranges in all but one patient, that presented with elevated TSH. None of the patients had any congenital malformations.

The majority of the cysts were unilateral and detected in the right ovary in 23 (69.7%) of patients. (Fig.1) There were five cases with bilateral cysts. All cysts were small; mean size of the cysts was  $15.0 \pm 5.0$  mm (range 10mm and 30mm). (Fig. 2) Ultrasonographic evaluation revealed simple cysts - completely anechoic, homogeneous, thin-walled, unilocular structures in the ovarian tissue - in 29 (87.8%) cases; the cyst wall was imperceptible with sonography in 7 of these cases. Thick-walled septated cyst which contained blood clots or debris were identified in 4 cases (12.2%).



Fig. 1. Ovarian cysts in 2 months old girl.

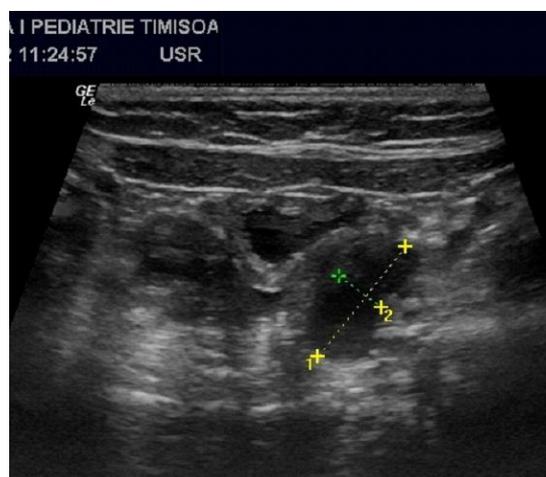


Fig. 2. Ovarian cyst under 2 cm in a 4 months old girl.

No complications were noted (torsion, haemorrhage, peritonitis, bowel obstruction or respiratory distress).

Periodic ultrasound examinations revealed a tendency towards spontaneous regression of the cysts. Most of the cases resolved spontaneously by the age of one year.

### Discussions

NOC are being diagnosed more often now that routine ultrasonography is carried out antenatally and postnatally. A truly cystic abdominal mass in a female newborn is most likely to be an ovarian cyst, although duplication cyst or mesenteric cyst should be considered in the differential diagnosis. There is controversy about the best treatment for these cysts, opinions ranging from oophorectomy to follow up by ultrasonography alone.

Follicular ovarian cysts in fetuses and neonates are common, and increase in frequency with advancing gestational age and some maternal complications, such as diabetes mellitus, preeclampsia, and rhesus isoimmunization, in which the large placentas determine elevated placental chorionic gonadotropin levels. Under the

hormonal influence, follicular cysts develop in the fetus, and can be seen on ultrasound by 28 to 32 weeks gestation [15]. In our case, 36% of the infants originated from pregnancies complicated by maternal diabetes, toxemia and Rh isoimmunization. Simple ovary cysts were detected by ultrasound in two cases diagnosed with congenital adrenal hyperplasia due to 21-hydroxylase deficiency. (Fig.3)

Serum estrogen and HCG levels experience a postnatal decrease, as the maternally produced hormone levels fall. Fetal gonadotropins (FSH and LH) decrease during the last trimester of pregnancy, but increase subsequently after birth, reaching a peak at 3 to 4 months of age, probably as a response to the postnatal fall in estrogen. [16] The increase in gonadotropins after birth and persistence in the first few months of life is attributed to immaturity of the hypothalamic-pituitary-ovarian axis ("gonadostat"). Once the "gonadostat" matures, the hypothalamus and pituitary become sensitive to the negative feedback of low levels of sex steroids, resulting in the fall of FSH and LH to normal, prepubertal levels. [17,18]



Fig. 3 Left ovarian cysts in a 5 months girl with congenital adrenal hyperplasia due to 21-hydroxylase deficiency.

Simple cysts less than 2 cm in diameter are considered physiologic. Larger and complex cysts are more likely to be non-physiologic. Since the cysts usually result from hormonal stimulation, NOC patients do not associate chromosomal and congenital malformations. [19] None of the infants from our study presented any anomalies.

The differential diagnosis of a neonatal intraabdominal cystic mass includes: genitourinary tract disorders (eg, reproductive tract anomalies, urinary tract obstruction, urachal cyst), gastrointestinal tract disorders (eg, mesenteric or omental cyst, volvulus, colonic atresia, intestinal duplication), and miscellaneous disorders (eg, choledochal, splenic, or pancreatic cyst, lymphangioma).

The treatment of ovarian cysts is not standardised; it depends on the size and appearance of the cyst based on sonographic examination. Some authors report that complex but asymptomatic neonatal ovarian cysts have a natural tendency towards spontaneous resolution and, therefore, recommend conservative approach through clinical and

sonographic monitoring. Postnatally asymptomatic ovarian cysts smaller than 5 cm in diameter, even exceeding 5 cm at initial diagnosis, with tendency to regress should be closely monitored until spontaneous resolution. If they regress spontaneously, no surgical intervention is necessary independent of their sonographic appearances. Symptomatic cysts or cysts with a diameter greater than 5 cm that do not regress or enlarge should be surgically treated [20].

#### Conclusions

Ovarian cysts are seen more frequently than expected in the neonatal period. Ovarian cysts are the rule, not the exception in newborn infants. In our case, due to the fact that all cysts were small (< 4 cm), and in the absence of complications, it has been possible to apply a wait-and-see policy, assessing the course of this condition by means of follow-up program - non-invasive periodic ultrasound monitoring.

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