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REVIEW OF CASES WITH ANTENATAL RENAL PELVIC DILATATION AND ITS FETAL CONSEQUENCES

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ABSTRACT

Renal pelvic dilatation is the most common form of the fetal anomalies detected with antenatal ultrasonography. Its reported incidence is 1-5 % of all pregnancies. The renal pelvic dilatation may be both unilateral and bilateral. However, the unilateral form is more common. Different classification systems are used for the determination of the renal pelvic dilatation with imaging systems during the fetal period. The most commonly used parameter for the diagnosis of the renal pelvic dilatation is the measurement of the anteroposterior diameter (APD) of the renal pelvis on the transverse plane. The possibility of regression of the low-risk renal pelvic dilatation measured in the 3rd trimester during the antenatal period is considerably high. A cut-off value of 5 mm is an acceptable measurement value for the diagnosis of renal pelvic dilatation during the 2nd and 3rd trimesters. The parents should be consulted if further investigations become necessary due to the postnatal insistence of the pelvic renal dilatation.

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INTRODUCTION

Renal pelvic dilatation is the most common form of the fetal anomalies detected with antenatal ultrasonography. Its reported incidence is 1-5 % of all pregnancies[1-3]. The renal pelvic dilatation may be both unilateral and bilateral. However, the unilateral form is more common[4-6]. It is 2.5 times more common among female infants than the male infants[7-9]. Different classification systems are used for the determination of the renal pelvic dilatation with imaging systems during the fetal period [9-11]. The most commonly used parameter for the diagnosis of the renal pelvic dilatation is the measurement of the anteroposterior diameter (APD) of the renal pelvis on the transverse plane[12,13]. According to the measurement of the anteroposterior diameter on the transverse plane of the kidney, it is classified usually as mild, moderate and severe [14,15]. In this study, our objective was to measure the renal pelvic dilatation in the infants of the pregnant women followed up in our hospital and to compare the results with the results in the literature. The routine fetal anomaly screening was performed between the 18th and 23rd gestational weeks. The study was evaluated by a single perinatologist in one center and the imaging examination was carried out with a 4D ultrasound device. The cases, who had a minimum anteroposterior diameter of 5 mm on the transverse plane of the fetal renal pelvis and a diameter smaller than 5 mm concomitant with other major anomalies in the ultrasonographic examination, were included in the study.

METHODS

The objective of this study was to evaluate all pregnant women, who applied to the perinatology department of the Health Sciences University (SBÜ) Derince Training and Research Hospital, Alikahya campus, Izmit between July 2017 and February 2018 and underwent detailed fetal anomaly screening with ultrasound and diagnosed with fetal renal pelvic dilatation following the measurement of the anteroposterior diameter (APD) of the renal pelvis and referred to the consultation with the pediatric surgery.

The routine fetal anomaly screening was performed between the 18th and 23rd gestational weeks. The study was evaluated by a single perinatologist in one center and the imaging examination was carried out with a 4D ultrasound device. The cases, who had a minimum anteroposterior diameter of 5 mm on the transverse plane of the fetal renal pelvis and a diameter smaller than 5 mm concomitant with other major anomalies in the ultrasonographic examination, were included in the study. All measurements of the anteroposterior diameter (APD) of the renal pelvis on the transverse plane were performed in the 2nd or 3rd trimester by the same perinatologist using a GE Voluson E6 BT 17 (Zipf Austria) ultrasound device.

Regarding the literature, the renal pelvic dilatation is categorized into 3 groups according to the measurements of the anteroposterior diameter (APD) of the renal pelvis on the transverse plane. According to this

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classification; in the 2nd trimester, a diameter of 5-6 mm is considered as a mild risk, 7-10 mm as a moderate and 10 mm as a high risk; in the 3rd trimester, 7-9 mm is considered as a mild, 10-15 mm a moderate and a diameter larger than 15 mm as high risk.

RESULTS

The anteroposterior diameter of the renal pelvis on the transverse plane was evaluated in 4216 pregnant women between July 2017 and February 2018 and renal pelvic dilatation was detected in 69 cases (1.6 %). The mean age of the evaluated pregnant women was 28.7 years. The fetal anomaly screening was done in 47 pregnant women (68.1 %) in the 2nd trimester and in the remaining 22 pregnant women (31.9 %) in the 3rd trimester. In 50 % of the cases, the renal pelvic dilatation was unilateral and in the 50 % bilateral. In 82.7 % of the cases, the renal pelvic dilatation was regressed or completely disappeared in the postnatal ultrasonographic examination performed during the follow-up period. However, in 17,3 % of the cases, renal pelvic dilatation was still present in the postnatal examinations. Regarding the cases, who were screened for fetal anomalies in the 2nd trimester and diagnosed with renal pelvic dilatation (n=47); 41 cases were in the mild (87,2 %), 5 in the moderate (7.2 %) and 1 case in the high-risk group (1.4 %). On the other hand, considering the cases, who were screened for fetal anomalies in the 3rd trimester and diagnosed with renal pelvic dilatation (n=22); 16 cases were in the mild (72,7 %), 3 cases in the moderate (13,6 %) and 2 cases in the high-risk group (9 %). Regarding the infants with renal pelvic dilatation (PRD); 2 had also ventricular septal defect (VSD), 1 had omphalocele, 1 had choroid plexus cyst and 1 had rocker bottom foot. In addition, in infants, who had RPD; 2 had a unilateral polycystic kidney, 2 had a unilateral renal agenesis and 2 had a unilateral bifid pelvis. 3 of 11 patients, who were followed up in the postnatal period, underwent pyeloplasty. These patients are still under follow-up.

DISCUSSION

In this study, which was conducted in our clinic, we determined that the incidence of the renal pelvic dilatation was 1.6 % in the population of the pregnant women. Regarding the literature, the rate of the renal pelvic dilatation detected during the fetal anomaly screening was 1-4.5 % among pregnant women. There are studies in the literature, which stated that the rate of the renal pelvic dilatation may increase up to 18 %, if the cut-off value for the renal pelvic dilatation measurement is accepted as 3 mm [20-22]. In their study, Chudleigh et al. found an incidence of 0.7 % and all cases were considered in the low-risk group[18-20]. Ahmad et al. also reported similar renal pelvic dilatation rates in the population of pregnant women. In our study, the measurement results were between the rates of the renal pelvic dilatation reported in the literature [23-26]. The different rates stated in the literature are a result of different accepted cut-off values. The accepted cut-off value was 5 mm in our study. There are several other studies, in which the same cut-off value was used [16,17, 26-30]. The British Maternal & Fetal Medicine Society recommends 5 mm as the cut-off value and NHS national fetal anomaly screening programme defines the diameters greater than 7 mm as renal pelvic dilatation [11,13].

There is a difference of opinion between the radiologists and pediatric urologists considering the evaluation of the renal pelvic dilatation. In 2014, a multidisciplinary meeting was organized in the USA to discuss the diagnostic criteria of the renal pelvic dilatation and the cut-off value was defined as 4 mm between the 16th and 27th gestational weeks similar to the definition of the Society for Fetal Urology (SFU) [10]. However, a cut-off value of 4 mm has a relatively low specificity for the renal pelvic dilatation. It provokes unnecessary concerns in the future mother and her family. In our study, we detected renal pelvic dilatation in 1.6 % of all pregnant women. Only 14.4 % of these cases were in the moderate and high risk groups. In 82.7 % of the cases in the low-risk group, the renal pelvic dilatation was regressed or completely disappeared in the postnatal ultrasonographic examination performed during the follow-up period. Our research findings were consistent with the literature [25,26,28]. The results of the multicenter study conducted by Longpre et al. [32] in 2012 and of the study conducted by Lee et al. [18] with a large subject group in 2014 were consistent with our results. In our study, only 3 infants with severe renal pelvic dilatation were operated due to the absence of regression during the postnatal follow-up controls. The retrospective design of our study, different follow-up interval, postnatal follow-up controls of the moderate and high-risk group patients in different health centers are the reasons to be considered for this low rate.The short follow-up period, restricted access to the screening results of the pregnant women, single-center design, restricted postnatal ultrasonographic examination of infants were the limiting factors of our study. The possibility of regression of the low-risk renal pelvic dilatation measured in the 3rd trimester during the antenatal period is considerably high.A cut-off value of 5 mm is an acceptable measurement value for the diagnosis of renal pelvic dilatation during the 2nd and 3rd trimesters. The parents should be consulted if further investigations become necessary due to the postnatal insistence of the pelvic renal dilatation [29-33].

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