OLIGOHYDRAMNIOS IN SINGLETON GESTATION

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1. INTRODUCTION

The measurement of the amount of amniotic fluid (AF) can be performed using different techniques. The two most commonly used are the deepest vertical pocket (DVP) and the amniotic fluid index (AFI).

Deepest vertical pocket: this is performed by measuring the maximum vertical column of fluid free of foetal parts and umbilical cord in a vertical plane. It is considered normal between 2 to 8 cm.

Amniotic fluid index (AFI): this is the value obtained from the sum of maximum vertical columns of fluid, free of foetal parts or umbilical cord, in each of four quadrants delimited by the intersection of two perpendicular lines on the maternal abdomen: longitudinal midline with longitudinal transverse midline between pubic symphysis and fundus. The transducer is placed in a sagittal plane and as perpendicular as possible to the floor. AFI values between 5 and 25 cm are considered normal. It is feasible to perform it from 24 weeks of gestation.

There is controversy about the best method for assessing the amount of AF. While DVP is more specific, AFI has a higher sensitivity to identify AF reduction, but such increased detection does not correlate with improved perinatal outcomes in the general population. Therefore, in low-risk gestations, the AF measurement should be performed using DVP as a screening tool. In twin gestations, DVP should also be used as a screening tool. We should reserve the use of AFI for gestations with an associated pathology such as growth restriction, chronologically prolonged gestation or decreased foetal movements.

We should define oligohydramnios as the presence of a DVP < 2 cm, it being considered as severe oligohydramnios/anhydramnios when it is less than 1 cm, or an AFI < 5.

2. AETIOLOGY

We can define three groups of causes of oligohydramnios:

- Foetal causes: intrauterine growth restriction (IUGR), chronologically prolonged pregnancy (CPP), foetal infection with cytomegalovirus (CMV), urinary tract obstruction (bilateral ureteral obstruction, posterior urethral valves), renal pathology (bilateral renal agenesis, bilateral multicystic dysplasia, polycystic kidneys) and neural tube defects.

- Placental-membrane causes: premature rupture of membranes (PROM).

- Maternal causes: maternal medication (prostaglandin synthesis inhibitors, angiotensin-converting enzyme (ACE) inhibitors)

In the second trimester of gestation, the presence of PROM accounts for 50% of cases of oligohydramnios, followed by IUGR and foetal malformations in 20% and 15% respectively, with only 5% of cases being idiopathic.

3. STUDY PROTOCOL

1. Rule out, by means of focused medical history, the intake of drugs such as prostaglandin synthesis inhibitors or angiotensin-converting enzyme inhibitors.

2. Ask regarding vaginal fluid leaking and perform a vaginal examination to rule out PROM (overt hydrorrhea or positive rapid test). For women who refer to vaginal fluid leaking but with negative vaginal examination and a rapid test, a fluorescein test could be performed.

3. Measure blood pressure

4. Perform detailed ultrasound scan, assessing:
    a. Estimated foetal weight (EFW) and feto-maternal Doppler
    b. Placenta evaluation for signs of thrombosis or infarction (such as hypoechoic or mixed echogenicity areas) or haematomas.
    c. Anatomical evaluation (nephrourological, neural tube)
    d. Evaluate signs of infection (microcephaly, ventriculomegaly, hyperechoic foci in parenchyma, intestinal hyperrefringence)

5. Request maternal CMV serology
    a. An IgG-/IgM- or IgG+/IgM- without ultrasound signs rules out CMV infection
    b. If IgM+ or IgG+/IgM- with ultrasound signs, a CMV-PCR of the amniotic fluid is indicated

6. An invasive procedure (amniocentesis is the technique of choice if technically possible) is indicated in the following cases:
    a. Non-placental (normal Doppler) early FGR
    b. Congenital malformations
    c. Ultrasound signs of infection (such as microcephaly, ventriculomegaly, hyperechoic foci in parenchyma, intestinal hyperrefringence)
    d. Positive maternal CMV serology (IgM+ or IgG+/IgM- with US signs)

    - If there is an indication for CMV-PCR and the karyotype is unknown, QF-PCR should be added.
    - In case of congenital malformation, array-CGH should be added and if CMV IgG+ or unknown serologies, CMV-PCR should also be added.
    - In some cases of suspected congenital tubulopathy, β2-microglobulin determination in foetal blood may be indicated.

4. PROGNOSIS

The prognosis is directly dependent on the underlying cause of oligohydramnios. In idiopathic cases, the prognosis depends on the severity of the oligohydramnios and the gestational age of onset.

- In cases of <u>severe idiopathic oligohydramnios</u> (DVP<1) maintained more than one week and below 24 weeks, parents should be informed of a risk of perinatal mortality due to pulmonary hypoplasia of 15%, and a risk of skeletal deformities or malpositions of about 10%, many of which are correctible postnatally.

- <u>In term gestations with idiopathic oligohydramnios</u>, a higher risk of perinatal complications has been described, such as caesarean section for suspected loss of foetal well-being, meconium aspiration syndrome, APGAR <7 at 1 and 5 min and admission to neonatal ICU, although

there are no randomised studies evaluating the best management of these gestations or the timing of delivery.

5. CLINICAL MANAGEMENT

Clinical management of oligohydramnios is mainly based on the cause of the oligohydramnios and the gestational age at diagnosis:

- In those cases in which PROM or IUGR are diagnosed, or in those cases associated with prolonged gestation, the specific protocol for each pathology should be followed.

- In cases where drugs are being taken, they should be discontinued. If prostaglandin synthesis inhibitors have been taken, evaluation of ductus arteriosus and tricuspid flow should be performed. If there is a restriction (PI<1 or significant tricuspid regurgitation (holosystolic, >200 cm/s)), a control should be performed every 48 hours until normalisation.

- Although there is still controversy, recent evidence seems to indicate that patients with idiopathic oligohydramnios have worse neonatal outcomes. Accordingly, the proposed management is:

  -Follow-up: Weekly Doppler study and CTG (from 28 weeks). Foetal weight estimation every two weeks.
  If pathological or abnormal Doppler: delivery according to IUGR protocol (regardless of the EFW percentile).

  -Delivery: Expectant management is recommended until 37 weeks' gestation if foetal well-being is normal. There is no contraindication to using prostaglandins and vaginally inserted controlled-release prostaglandin E2 is the preparation of choice.

  -Management of labour: continuous monitoring is indicated.

ANNEX 1. Algorithm oligohydramnios diagnosis and clinical management