Epidemiology of amniotic fluid disorder at the point G University Hospital Center of Bamako

Summary

Aim: We perform this study to determine maternal and fetal outcome of amniotic fluid disorder during pregnancy.

Method: This was a prospective study at Point G Hospital over a 12-month period. It concerned pregnant women in the third trimester of pregnancy with a single fetal pregnancy, and having delivered in the service. We used the Grannum classification for the placenta and the Phelan index for the measurement of amniotic fluid. A Phelan index between 5 and 25 cm was considered normal. A Phelan index > 25 cm was considered as polyhydramnios and less than 5 cm as oligohydramnios. We determined amniotic fluid disorder according to the grade of placenta, the newborn weight and the Apgar score. The tests used for statistical analysis were chi² and Fisher’s exact test, with a significance threshold p<0.05.

Result: Polyhydramnios was found in 3.7% of cases and oligohydramnios in 9.7% of cases. We found Apgar score<7 in 7.8% of cases with normal amniotic fluid. 6.9% were polyhydramnios and 9% were polyhydramnios (P=0.93). All patients with amniotic fluid disorder had delivered normal-weight newborn. 13% of patients with oligohydramnios had a placental grade II vs 4.7% with normal amniotic fluid (p<0.05).

Conclusion: We did not find a significant association between amniotic fluid abnormalities and maternal and fetal outcome.

Keywords: prenatal ultrasound, amniotic fluid disorder, perinatal outcome

Introduction

The amniotic fluid is the middle in which evolves the unborn and is indispensable to its normal development. When he is the seat of anomalies, they are often diagnosed at course of the prenatal ultrasound. According to Papernik et al., 8, 2% of pregnancies would have an amniotic index > 24 cm and 0, 4% of pregnancies would be affected by the oligohydramnios. The classic definition of Merger distinguishes «the excess of liquid» between 1 and 2 liters and the polyhydramnios after 2 liters. Well expected that diagnostic and therapeutic cannot satisfy a clinical measure of the quantity of amniotic fluid. What is why it is necessary to screening ultrasound during pregnancy in order to allow treatment. That is as well as Phelan in 1987 proposes of divide the abdomen in 4 quadrants by two straight perpendicular passing by the navel and add the measure of the depth of 4 large tanks. Five groups are defined in this method depending of the measure: oligohydramnios (the <5 cm), the little abundant (5 cm≤the<8 cm), the of volume normal (8 cm≤the<18 cm), excess of the amniotic fluid (18 cm≤the<25 cm) and polyhydramnios (≥25 cm). This method is the more used today in the international literature under the term of «amnionic fluid index» (AFI). Some authors think that single deepest pocket (SDP) method is possible: the deepest pocket is measured vertically. A measurement under 2 cm defines oligoamnios and where it is over 8 cm there is polyhydramnios.

Material and method

It was a prospective analytical study in the service of gynecology obstetrics of Point teaching hospital running at 1st December 2013 to November 30th 2014 with a regular recruitment during 12 month of the year for respect the seasonality. Point G teaching hospital is level II who receives of references of all the country. Included in this study were all women in the third trimester of pregnancies who were admitted to antenatal care with a single pregnancy, and who gave birth in the service or in another service under the supervision of the interviewer to complete the filling from the survey sheet. Not included in this study were women with premature rupture of membranes during pregnancy, multiple pregnancies due to amniotic fluid abnormalities related to placentation, and those lost to follow-up at the time of delivery. For the classification of placental rank we used that of Grannum and for the measure of amniotic fluid we used the index of Phelan. Phelan index≥25 cm was considered polyhydramnios and lower to 5 cm as oligohydramnios. The individual written consent was obtained for all the women of the study. The protocol of research has obtained the approval of committee of ethics of the faculty of medicine under the number 2012/40/CE/FMOS. The analyses statistics were by SPSS® 12 software version. The statistical tests used were the Khi² and the exact test of fisher, the analysis of variance has served to the comparison with its interval of confidence (IC) to 95%.

Results

The population of our study was predominantly composed of primipares either respectively 48, 6%. We recorded 3, 3% of large multipares. In our study 86, 6% of patients had a normal amniotic fluid. The polyhydramnios was found in 3, 7% of case and the oligoamnios...
in 9.7% of case 31% of patients of our study have said practice of the geophagy during pregnancy among which 13.8% presented an oligoamnios vs 10.1% having a normal amniotic fluid and one case of polyhydramnios (9.1%). In our study 13% of patients having an oligoamnios had placental Granium II vs 4.7% having a normal amniotic fluid (Table 1).

<table>
<thead>
<tr>
<th>Placental gran numm</th>
<th>AFI*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Normal</td>
<td>209</td>
</tr>
<tr>
<td>Oligohydramnios</td>
<td>17</td>
</tr>
<tr>
<td>Polyhydramnios</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>231</td>
</tr>
</tbody>
</table>

*Amniotic fluid index χ²=11.57 p=0.004

Table 2 Distribution according to placental Grannum and amniotic fluid disorder

<table>
<thead>
<tr>
<th>AFI*</th>
<th>Polyhydramnios</th>
<th>Oligohydramnios</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4-7</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>≥8</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3 Distribution according to fetal weight and amniotic fluid disorder

<table>
<thead>
<tr>
<th>Fetal weight (mg)</th>
<th>AFI*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;1000</td>
</tr>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Normal</td>
<td>1</td>
</tr>
<tr>
<td>Oligohydramnios</td>
<td>0</td>
</tr>
<tr>
<td>Polyhydramnios</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
</tr>
</tbody>
</table>

*Amniotic fluid index χ²=1.29 p=0.86

Discussion

Limitations of the study: We have not found enough studies done in Africa on this subject. Therefore we were unable to calculate the sample size needed for this study. In addition, we were unable to access patient history to determine risk factors as some patients had not performed prenatal care before. If in the study of Kelh S et al. they determined whether the amniotic fluid index (AFI) and the single deepest vertical pocket (SDP) technique for estimating amniotic fluid volume, in our study we used to determine estimating amniotic fluid volume by AFI. Our study was predominantly composed of primiparae (48.6%). We recorded 3.3% of large multiparae. That is to the image of our population and this is found in our studies previous. In our study 86.57% of patients had the normal amniotic fluid. This is found in the study of Sandlin AT who esteems that the volume of fluid increases with gestation to a maximum at 36-37 weeks. The amniotic fluid disorder varies according to the literature depending of techniques of measures, of number of embryo and of standards deductions by each center. Thus, according to Papernik E et al., 8. 2% of pregnancies would have an amniotic index >24cm and 9.4% of pregnancies would be affected by the Oligohydramnios. These results are lower to those found in our study with respectively 3.6% of polyhydramnios and 9.72% of oligoamnios. This difference could explain by the fact that in our study we don’t have included the multiple pregnancies. According to Smith CV et al. the chronic polyhydramnios is of good prognosis. in 30 to 40% of cases it has not found any mother neither fetal causes and the fetal mortality was of 2.4%. This is confirmed by our study who found 19 (7.4%) case of score of Apgar <7 among the new born from of pregnancy with a normal amniotic fluid vs 2 (6.9%) and 1 (9%) respectively in case of Oligohydramnios and of polyhydramnios the difference is not no significant (p = 0.93). According to Papernik et al. it exists a correlation between the polyhydramnios and the occurrence of malformations including 18% of anomalies of nervous system 31% the digestive anomalies and 7% the poly malformations. In a previous study in 1987 at more of 9000 routine ultrasounds made at third quarter Hill LM and all. had found 80% of excess of liquid amniotic, 15% of polyhydramnios whose only 1/3 was associate to one fetal malformation. To improve fetal outcome some authors proposed drainage of amniotic fluid under ultrasound guidance or the use of Corticosteroids to improve lung maturity if preterm delivery is imminent. That was confirmed by Golan A et al in 1993. In our study we recorded one case of laparoschisis among the patients having polyhydramnios. The new-born has presented respiratory distress and is died before any treatment. The prognosis of malformations associated to the oligohydramnios is of as much worse that its occurrence is early. The anomalies the more often associated to the oligoamnios are the obstructive uropathies and the polymalformative associations. Some authors have proposed adding of physiological serum lukewarm for allow one good contrast ultrasound in order to power search the fetal malformations. Magann et al. in

2004 have found that the amniotic index has a weak value predictive of prognosis of the pregnancy that this either for the polyhydramnios or the oligohydramnios. That is confirmed by the studies of Driggers RW\textsuperscript{15} and Zhang J\textsuperscript{10} who have not found of difference significant concerning the prognosis of new-born of pregnancy with an oligohydramnios in a comparative randomized study. Thus more of 90 undetermined causes, Martinez-Frias ML et al.\textsuperscript{19} in Spain, in a multicentric study on the etiology of congenital malformations, 27 000 anomalies either 3,7% was associated to the polyhydramnios and 30% was associate to the oligohydramnios. However according to Senat MV\textsuperscript{20} oligohydramnios could be the sign of renal failure. Indeed this would be the weak placental invasion that would the oligoamnios. That explains the correlation of the amniotic fluid index to maternal and fetal Doppler as found in its study. In our study we recorded 3 cases of Apgar score <7 among the patients with amniotic fluid disorder with a birth weight normal in 100% of cases. However 13% of patients having one oligohydramnios had placental grade II vs 4, 7% having a normal amniotic fluid. The difference is statistically significant (p = 0,004). If AFI method has increased the diagnosis rate of oligohydramnios and labor induction for oligohydramnios it doesn’t improve perinatal outcome.\textsuperscript{8} Otherwise 13, 8% of patients having an oligohydramnios have said practice of the geophagy during pregnancy vs 10, 1% among the patients having a normal fluid index, the difference is not statistically significant (p = 0, 87).

**Conclusion**

We didn’t find a significant association between amniotic fluid disorder and maternal ET fetal outcome. Amniotic fluid disorders are rare during pregnancy. They usually have no effect on maternal and fetal outcome.

**Acknowledgments**

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**Conflicts of interest**

We do have no conflict of interest for this work, and we declare that this article has not fact the object and publication or a submission in another magazine.

**References**