Retrospective Analysis of Polyhydramnios Cases

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Absract

Objective: To evalute the pregnancies with polyhydramnios who had delivered in our clinics and matched with control group retrospectively.

Methods: Ninety five pregnancies with polyhydramnios (group 1) delivered were evaluated retrospectively and ninety five pregnancies delivered spontaneously were chosen randomly as control group (group 2) between January 1998 and June 2004 at Obstetrics Department. The demographic characteristics, maternal age, delivery modes, neonatal weight, apgar scores, cesarean rates and indications, fetal anomalies, perinatal mortality rates were evaluated for each group. Student –t and Chi-squre tests were used for statatistical analyses.

Results: The mean age of group 1 was 29.72±7.34 and group 2 was 30.74±2.01 (p>0.05). Prevalance rate of polyhydramnios was 1.01%. The etiology of polyhydramnios was seen as idiopathic causes 41 (43.15%), Central nervous system anomalies 21 (22.10%), gastrointestinal system anomalies 10 (10.52%), diabetes mellitus 8 (8.42%), hydrops fetalis 7 (7.36%), other fetal causes 7 (7.36%), twin-to-twin transfusion syndrome 1 (1.05%). Twenty three cases (24.21%) had preterm labour, 11 (11.57%) cases were twin pregnancy in polyhydramnios group. Cesarean section rate was 35 (36.84%) in group 1 and 44 (46.31%) in group 2 (p>0.05). The most common cesarean endication was fetal distress (11.57%) in group 1 and previous cesarean in group 2 (21.19%). Median birth weight was 2224 ± 1219 in group 1 and 3414 ± 521 in group 2 (p<0.001). Fetal anomaly rate was 37.89% in group and 3.15% in group 2 (p<0.001). Perinatal mortality rate was 54.73% in group 1 and 6.31% in group 2 (p<0.001). 1st minutes apgar score was 3.2 ± 2.7 and 5th minutes apgar score was 3.8±3.8 in group 1 and 1st minutes apgar score was 7.09 ± 1.5 and 5th minutes apgar score was 8.8±1.9 in group 2 (p<0.001).

Conclusion: Although the common seen etiologies of polyhydramnios were idopathic and central nervous system, preventable causes of polyhdramnios such as Rh isoimmunisation and diabetes mellitus also plays important role in the etilogy of polyhydramnios. Improvement of antenatal care services might reduce preventable causes of polyhdramnios. Termination of anomalies such as anencephaly at early gestasional week reduces maternal risks and economical loss.

Keywords: Polyhydramnios, etiology, fetal anomaly.

Polihidramnios olgularının retrospektif analizi

Amaç: Kliniğimizde doğumu gerçekleşen polihidramnios olgularının retrospektif analizini yapmak ve kontrol grubu ile karşılaştırmaktır.

Yöntem: Ocak 1998 ile Haziran 2004 tarihleri arasında kliniğimizde doğum yapan 95 polihidramnios olgusundan grup1, aynı dönemde miadında doğum yapan ve randomize seçilen 95 normal olgudan grup 2 oluşturuldu. Her iki grubun anne yaşları, doğum şekilleri, doğum ağırlıkları, APGAR skorları, sezaryen oranı ve endikasyonları, fetal anomaliler ve perinatal mortalite açısından retrospektif olarak analiz edildi. İstatistiksel analizlerde student t ve ki-kare testleri kullanıldı.

Bulgular: Grup 1 olgularının ortalama yaşı 29.72±7.34 ve grup 2'nin ise 30.74±2.01 olarak bulundu (p>0.05). Aynı dönemde polihidramnios tüm gebelikler içerisinde %1.01 oranında bulundu. Polihidramnios etiyolojisinde sıklık sırasına göre; idiopatik 41 (%43.15), santral sinir sistemi lezyonları 21 (%22.10), gastrointestinal sistem anomalileri 10 (%10.52), diabetes mellitus 8

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(%8.42), immun hidrops fetalis 7 (%7.36), diğer fetal nedenler 7 (%7.36) ve ikizden ikize transfüzyon sendromu 1 (%1.05) olguda saptandı. Olguların 23 (%24.21)'unda preterm eylem, 11 (%11.57)'inde ikiz gebelik saptandı. Grup 1'de 35 (%36.84) olguda, grup 2'de ise 44 (%46.31) olguda doğum sezaryen ile gerçekleşti (p>0.05). En sık sezaryen endikasyonu grup 1'de fetal distres (%11.57), grup 2 ise eski sezaryen (%21.19) saptandı (p>0.05). Grup 1 olgularında neonatal ağırlık 2224 ±1 219 g ve grup 2'de 3414 ± 521 g bulundu (p<0.001). Fetal anomali grup 1'de %37.89, grup 2'de %3.15 oranında bulundu (p<0.001). Perinatal mortalite grup 1'de %54.73, grup 2'de ise %6.31 oranında bulundu (p<0.001). Grup 1 olgularında 1. dakika APGAR skoru 3.2 ± 2.7 ve 5. dakika 3.8 ± 3.8, grup 2'de ise 7.09±1.5 ve 8.8 ± 1.9 olarak bulundu (p<0.001).

Sonuç: Çalışmamızda etyolojik faktörler arasında en sık idyopatik ve santral sinir sistemi anomalileri saptanırken antenatal önlenebilen immünize Rh ve Diabetes Mellitus gibi sebepler de önemli yer tutmaktadır. Antenatal bakım hizmetlerinin arttırılması önlenebilir etiyolojik faktörleri azaltabilir. Aynı zamanda yaşamla bağdaşmayan anensefali gibi anomalilerin erken gebelik haftalarında sonlandırılması maternal riskleri azaltır ve daha az ekonomik kayba neden olur.

Anahtar Sözcükler: Polihidramnios, etyoloji, fetal anomali.

Introduction

Polyhydroamnios is defined as the recruitment of 2000 ml or more amniotic fluid.[1] the presence of 500-2000 ml amniotic fluid at term is accepted as normal. It is also defined as the width of amnion fluid pouch being more then 8 cm in ultrasonograpy or the amnion fluid index being more than 95% for gestational age or the amount of amniotic fluid, amniotic fluid index (AFI) is calculated by the addition of the vertical depth of the biggest pouch in the four equal quadrants. In a 26-39 week pregnancy the upper border of AFI is greater than 24 cm. Polyhydroamnios is seen in 1-3.2% of pregnancies.[2] Perinatal morbidity and mortality increase with polyhydroamnios. In polyhydroamnios, the frequency of congenital abnormalities increases but the ratios of chromosome abnormalities differ between studies for some unknown reason.[3]

In this study cases who had attended our clinic because of polyhydroamnios and had delivery were investigated retrospectively with respect to maternal and fetal characteristics.

Methods

A total of 95 polyhydroamnios cases who had deliveries in the 6 year period between January 1998 and June 2004, at Dicle University Faculty of Medicine Department of Obstetrics and Gynecology were studied retrospectively. All the information about the cases were obtained from the computer and folder data. Ages of the mothers, the procedure of delivery, birth weights, APGAR scores, caesarian ratios and indications, fetal anomalies were evaluated retrospectively for perinatal mortality. 95 cases who had deliveries because of polyhydroamnios were taken as Group 1, 95 cases who attended the clinic at the same time interval for term pregnancies and had deliveries were taken as group 2 (the control group). Both groups were evaluated retrospectively for procedure of delivery, birth weights, APGAR scores, fetal anomalies and perinatal mortality.

The results were evaluated by student-t test and chi square test and SPSS 11.0 statistical program were used, p<0.05 were accepted as statistically significant.

Results

95 cases who had deliveries with the diagnosis of polyhydroamnios between January 1998 and June 2004 were found. A total of 9318 deliveries were performed in our clinic during this time period. The ratio of the pregnant women who had deliveries with the diagnosis of polyhydroamnios to all of the deliveries was 1.01%. The greatest percentage of our cases were idiopathic polyhydroamnios 43.15% (n=41). The second greatest cause was fetal abnormalities 37.89% (n=36), among fetal abnormalities central nervous system abnormalities were the commonest. Among the

chromosomal causes of polyhydroamnios, Down syndrome was present in 2 (%2.1) cases. In 8 (%8.42) of the cases because of Rh immunization and in 1 (%1.05) because of non immune reasons hydrops had developed. DM was found in 7 of the polyhydroamnios cases (7.36%) (Table 1). Preterm delivery because of polyhydroamnios preterm 23(%24.21) and twin pregnancy were found in 11 (%11.57) cases.

Table 1. Factors in the etiology of polyhydroamniosis.

	n	%
1. Idiopathic	**41**	**43.15**
2. Diabetes mellitus in mother	**8**	**8.42**
3. Reasons belonging to the fetus		
a. Central nervous system lesions	**21**	**22.10**
1. Anencephalicus	13	13.68
2. Hydrocephalicus	5	5.26
3. Spina bifida	2	2.10
4. Encephalocel	1	1.05
b. Gastrointestinal system abnormality	**10**	**10.52**
1. Esophageal atresia	5	5.26
2. Duodenal atresia	4	4.21
3. Anus imperforates	1	1.05
c. Immune hydrops fetalis	**7**	**7.36**
d. Down syndrome	**2**	**2.10**
e. Non-immune hydrops fetalis	**2**	**2.10**
f. Skeletal displasia	**1**	**1.05**
g. Cystic higroma	**1**	**1.05**
h. Epidermolisis bullosa	**1**	**1.05**
4. Feto-fetal transfusion syndrome	**1**	**1.05**

When both groups were compared the average age of group 1 was 29.72 ± 7.34, of group 2 was 30.74 ± 2.01 ($p>0.05$). In group 1 in 35 (%36.84) cases, in group 2 in 44 (%46.31) cases had caesarian ($p>0.05$). In polyhydroamnios cases caesarian because of fetal distress was in the first line (%11.57).

The average birth weight of the babies belonging to group 1 was (2224 ± 1219 g.) and was lower than that of group 2 (3414 ± 521 g.) ($p<0.001$). Fetal abnormality ratios in group 1 cases was (%37.89) and were apparently higher than group 2 (%3.1) (2 hydrocephalus, 1 achondroplasia) ($p<0.001$). The perinatal mortality ratios in group 1 cases (%54.73) were apparently higher than that of group 2 (%6.31). First and 5th minute APGAR scores were higher in group 2 cases ($p<0.001$).

Discussion

Amniotic fluid normally is estimated to be 200 ml at 16th week, 1000ml at 28th week, 900 ml at 28th week and 800 ml at 40th week. Generally polyhydroamnios is seen in 1-3.25 of pregnancies.[2] Incidence of polyhydroamnios were reported as %0.4 by Queenan et al,[1] %3.3 by Chamberlain et al.[3] in our cases polyhydroamnios was seen %1.01 in accordance with literature.

Amniotic fluid volume changes during pregnancy; is controlled by dynamic relations between maternal, fetal and placental compartments.[4] When the balance between these compartments are lost the pregnancy is under risk.[5] The most frequent reason for polyhydroamnios is idiopathic.[6] In a study conducted on 149 patients Golan et al[7] found the cause in 2/3 of the patients to be idiopathic. In our study group the reason of polyhydroamnios was found to be idiopathic in 41 cases (%43.15).

In Rh immunization and fetal hydrops cases polyhydroamnios may be seen secondary to increased cardiac output. In fetuses with Rh immunization and fetal hydrops it has been shown that lactate concentration increases secondary to hypoxia and this increase in lactate creates an osmotic effect and moves the fluid in fetal compartment to maternal compartment.[8] In our study group polyhydroamnios secondary to fetal hydrops were seen in 9 (%9.47) cases; 7 of these hydrops fetalis cases were caused by immune and 2 were by nonimmune causes.

Polyhydroamnios accompanies fetal malformations especially central nervous system or gastrointestinal anomalies.[9,22] in a study conducted by Carlson et al.[10] fetal anomaly rates were found to be 44% in cases with polyhydroamniosis. In our study group fetal abnormalities were detected in 36 cases (%37.89) and this ratio was apparently higher than that of the control group ($p<0.001$). In polyhydroamniosis cases abnormalities encountered most frequently were central nervous system abnormalities and gastro intestinal system abnormalities were in the second line. Among central nervous system abnormalities anencephaly was the most frequent abnormality with 13 cases (%13.68). Problems in fetal swallowing in anencephaly, transudation of fluid from the meninges or polyuria as a result of vasopressin deficiency may cause increase in the amount of the amnion fluid.[11]

Polyhydroamnios may be accompanied by chromosomal abnormalities. Brady et al[12] found the rate of fetal trisomy in the idiopathic polyhydroamnios group as %3.2. Landy et al[13] in their series with 59 patients determined the rate of chromosomal abnormalities to be %1.7. the rate of chromosomal abnormalities in our cases were found to be %2.1 (2 trisomy 21).

Amniotic fluid problems and especially polyhydroamnios may be seen %12 in twin pregnancies.[14,23] In our study there were 11 twin pregnancy cases (%11.57). Feto-fetal transfusion was present in one. In feto-fetal transfusion syndrome it was shown that the acceptor fetus is polyuric, dilated glomeruli and distal collecting tubules were detected histologically and increase in cardiac output was shown in these cases.[15]

In maternal diabetes secondary polyhydroamnios incidence may be between %5-13. Fetal polyuria secondary to osmotic diuresis may cause polyhydroamnios in diabetes.[11] in our study group polyhydroamniosis related to diabetes was seen in 8 cases (%8.42).

One of the important maternal and fetal complications of polyhydroamnios is preterm labor and the risks caused by the labor.[16] In a study conducted by Many et al[21] preterm labor rate in 275 polyhydroamnios cases were found to be %18.9. In our study group preterm labor because of polyhydroamniosis was detected in 23 cases (%24.21).

Perinatal mortality rate in polyhydroamnios varies between %10 and %30.17 In a study conducted by Sickler et al[18] in their polyhydroamnios series of cases, perinatal mortality ratio was found to be %39. The ratio of perinatal mortality related to polyhydroamnios in our series was found to be %54.73 and this ratio was significantly higher than the control group ($p<0.001$). In cases with polyhydroamnios 1st and 5th minute APGAR scores and the average birth weights of the newborns (2224 ± 1219), were apparently lower in the control group ($p<0.001$). this apparently high perinatal mortality level may be related to the high congenital malformation and preterm delivery ratios, low APGAR score in the newborn and low average birth weight in polyhydroamnios cases. The fact that we are a referral center for the follow up and treatment of high risk pregnancies in our region contributes to the high mortality and morbidity ratios in our cases with polyhydroamniosis.

Caesarian delivery is increased in cases with polyhydroamnios.[19] In 35 of our cases caesarian was performed (%36.84) and caesarian because of fetal distress was in the first line (%11.5). The caesarian group when compared with the control group was not statistically significant ($p>0.05$). This situation may be explained by the high level of caesarians performed in our region.[20]

In conclusion; when poyhydroamnios is detected, the cases should be examined for fetal central nervous system and gastrointestinal system abnormalities, Rh immunization, and maternal diabetes mellitus. Necessary medical preventions must be performed to prevent preterm labor and fetal morbidity and mortality.

References

1. Queenan JT, Gadow EC. Polyhydramnios: Chronic versus acute. *Am J Obstet Gynecol* 1970; 108: 349-55.
2. Fisk NM, Moessinger AC. Oligohydramnios and polyhydramnios. In: Reed GB, Claireaux AE (eds), Diseases of the fetus and newborn, (2.ed), London: Chapman and Hall, 1995: 1243.
3. Chamberlain PF, Manning FA, Morrison I, Harman CR, Lange IR. Ultrasound evaluation of amniotic fluid volume.The relationship of marginal and decreased amniotic fluid volumes to perinatal outcome. *Am J Obstet Gynecol* 1984; 150: 245-9.
4. Chescheir NC, Seeds JW: Polyhydramnios and oligohydramnios in twin gestations. *Obstet Gynecol* 1988; 71: 882-4
5. Goldstein RB, Filly RA. Sonographic estimation of amniotic fluid volume. Subjective assessment versus pocket measurements. *J Ultrasound Med* 1988; 7: 363-9.
6. Hill LM, Breckle R, Thomas ML, Fries JK. Polyhydramnios: ultrasonically detected prevalence and neonatal outcome. Polyhydramnios: ultrasonically detected prevalence and neonatal outcome. *Obstet Gynecol* 1987; 69: 21-5.
7. Golan A, Wolman I, Saller Y, David MP. Hydramnios in singleton pregnancy: sonographic prevalence and etiology. *Gynecol Obstet Invest* 1993; 35: 91-3.
8. Soothill PW, Nicolaides KH, Rodeck CH, Clewell WH, Lindridge J. Relationship of fetal hemoglobin and oxygen content to lactate concentration in Rh isoimmunized pregnancies. *Obstet Gynecol* 1987; 69: 268-71.
9. Özgünen F, Evrüke C. Hidramnios ve Oligohidramnios. Beksaç S . Maternal – Fetal Tıp ve Perinatoloji. 1. baskı. Ankara, Nobel; 2001; 1132-41.
10. Carlson DE, Platt LD, Medearis AL, Horenstein J. Quantifiable polyhydramnios: diagnosis and management.: *Obstet Gynecol* 1990; 75: 989-93.
11. Teoh TG, Fisk NM. Hydramnios, oligohydramnios. In: James DK, Ster PJ, Weiner CP, Gonik B(eds). High Risk pregnancy, North Yorkshire: WB Saunders, 1999: 309.

12. Brady K, Polzin WJ, Kopelman JN, Read JA. Risk of chromosomal abnormalities in patients with idiopathic polyhydramnios. *Obstet Gynecol* 1992; 79: 234-8.
13. Landy HJ, Isada NB, Larsen JW Jr. Genetic implications of idiopathic hydramnios. *Am J Obstet Gynecol* 1987; 157: 114-7.
14. Koç A. Çoğul Gebelikler. Beksaç S. Maternal – Fetal Tıp ve Perinatoloji. 1. baskı Ankara, Nobel; 2001; 1122-31.
15. Naeye Rl, Milic AMB, Blane W. Fetal endocrine and renal disorders: clues to the origin of hydramnios. *Am J Obstet Gynecol* 1979; 108: 1251-6.
16. Clark Sl, De Vore GR. Prenatal diagnosis for couples who would not considerabortion. *Obstet Gynecol* 1987; 157: 114-7.
17. Carlson DE, Platt LD, Medearis AL, Horenstein J. Quantifiable polyhydramnios: diagnosis and management. *Obstet Gynecol* 1990; 75: 989-93.
18. Sickler GK, Nyberg DA, Sohaey R, Luthy DA. Polyhydramnios and fetal intrauterine growth restriction: ominous combination. *J Ultrasound Med* 1997; 16: 609-14.
19. Jacoby HE, Charles D. Clinical conditions associated with hydramnios: *Am J Obstet Gynecol* 1966; 94: 910-9.
20. Yalınkaya A, Bayhan G, Kale A, Yayla M. Dicle Üniversitesinde 20 Yıllık Sezaryen Oranı ve Endikasyonları: *T Klin Jinekol Obstet* 2003; 13: 356-60.
21. Many A, Hill LM, Lazebnik N, Martin JG. The association between polyhydramnios and preterm delivery. *Obstet Gynecol* 1995; 86, 389-91.
22. Volante E, Gramellini D, Moretti S, Kaihura C, Bevilacqua G. Alteration of the amniotic fluid and neonatal outcome. *Acta Biomed Ateneo Parmense* 2004; 75, 71-5.
23. Orhan A, Kurzel RB, Istwan NB, Rhea D, Burgess E, Stanziano G. The impact of hydramnios on pregnancy outcome in twin gestations. *J Perinatol* 2005; 25: 8-10.