An Assessment of Five Year Experience in Amniocentesis in Qatar

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Abstract:

Objective: The purpose of this study is to evaluate the risk of foetal loss attributable to amniocentesis and to assess the experience in technique, successful fluid aspiration in amniocentesis performed in our hospital.

Study Design: Medical record of 123 women who underwent amniocentesis between September 1996 till March 2002 were reviewed for indication, maternal, age, nationality, maternal age, parity, nationality, gestational age at procedure, physician operator, amniotic fluid reports and pregnancy outcome.

Result: Within 30 days of amniocentesis there were two (2.2%) foetal losses, 91 patients (74%) for genetic amniocentesis, 32 patients (26%) Rh isoimmunization, 4 cases (3.2%) no fluid aspiration and in 10 patients procedure repeated one week later for successful aspiration.

Conclusion: Amniocentesis-related total pregnancy loss rate was 2.2%. Successful aspiration of clear amniotic fluid increases with amniocentesis experience.

Key words: Amniocentesis, prenatal diagnosis, Rh isoimmunization, pregnancy loss rate.

Introduction:

Midtrimester amniocentesis remains the most popular technique for foetal genetic assessment, pregnant women who will be 35 years or older on their due date or who already have a child with a birth defect or have a family history of certain birth defects or pregnant women with abnormal genetic screening results generally will be offered this procedure.

Estimates in the literature of procedure-related complication rates range from 0.5% to 1.0%(1,2). Actual loss rates related to genetic amniocentesis vary among randomized studies(1,3) and may be confounded by transplacental needle passage(3), multiple needle insertions, large needle caliper(1), operator experience may also contribute to lower foetal mortality(4,5) but this has not been conclusively determined(6).

Recently blessed et al(7) presents data from their community hospital that indicated a higher complication rate of genetic amniocentesis (2.2% VS 0.3%, P=0.2) for obstetricians-gynecologists compared with perinatologist, furthermore, they suggested that midtrimester amniocentesis was safer at their hospital if it was performed by a perinatologist and speculated that obstetrician-gynecologist performing genetic amniocentesis may be misleading themselves and their patients.

Liley(8) in Auckland, New Zealand in 1961 published the well-known correlation between the deviation of the spectral absorption curve of liquor amnii resulting form bilirubin, and the severity of rhesus isoimmunization.

Since Liley’s studies the practice of amniocentesis had become a standard procedure in obstetric practice.

Materials and Methods:

Medical records of 123 women who underwent amniocentesis during the study period form September 1996 to March 2002. All procedures were performed from 15 to 35 weeks, with ultrasound guidance provided by a trained Sonographer, either by marking of a site for needle puncture on the maternal abdominal skin or performed under real-time monitoring.

Twenty-guage needles or Twenty Two-guage needles have been used. Maternal charts were reviewed for data that pertinent to the risk of foetal loss and pregnancy outcome, these factors included maternal age, parity, and ethnicity, indication for amniocentesis, gestational age at procedure, amniotic fluid reports, physician operator, and perinatal outcome.

Results:

A total of 145 trial of amniocentesis performed for 123 women, in 13 trial (10.5%) no fluid could be obtained, in 10 women amniocentesis attempted twice and in one woman 50 years old the procedure attempted three times at 16 weeks, 17
weeks and at 19 weeks fluid could be aspirated in four women (3.2%) amniocentesis attempts have been unsuccessful. The number of needle insertions needed for fluid aspiration had not been recorded, fluid samples were classified by gross appearance as clear in some, blood-tinged in others, but in many cases these were not recorded. The volumes of amniotic fluid aspirated have varied form 15-30 ml according to indication, for foetal Karyotype, or biochemical tests.

Care was taken to avoid placental penetration whenever possible; records were not available regarding the transplacental puncture, if any performed.

The physician operator was the specialist in (52%) and 18% performed by the resident in the Arab training program under the guidance and assistance of the consultant or the specialist. If the resident or specialist failed to obtain fluid on the first attempt, many of the second attempts were performed by the consultants (30%) of the attempts, shown in Figure 1.

The genetic amniocentesis performed for 91 women (74%) advanced maternal age was the most common indication (54%) shown in Figure 2 followed by ultrasound findings of foetal anomalies, history of abnormal infant born to the mother or to a family member, abnormal serum markers, and the miscellaneous indications includes parental carrier of translocation or inborn error of metabolism, history of recurrent abortions as shown in Figure 3. The Rh-is immunization indication for amniocentesis was for 32 cases 26%, shown in Figure 4. Figure 5 shows the distribution of patients by nationality 53% are Qatari. Five women from the genetic amniocentesis lost for follow up till delivery as some moved to their countries of origin and one patient form the rh-is immunization group. Figure 6 shows the distribution of case in the study period for five years month from Year 1996 and 2002 are omitted. Figure 7 shows the distribution of case in relation of the weeks of gestation.

Figure 1: Amniocentesis Trials Performed

Figure 2: Distribution of Maternal Age at time of Genetic Amniocentesis

Figure 3: Genetic Amniocentesis for the Year 1996-2002

Figure 4: Amniocentesis Trials Distribution by Rh. Isoimmunization and Genetic Study
No complications were encountered among the 31 cases of Rh-isoimmunization group, minor uterine irritability and resolved by rest and delivered at term, two patients delivered within a week of the procedure at 35-36/52 gestation, this procedure is becoming less and less now as the antenatal prophylaxis against Rh-isoimmunization was started in our hospital four years ago.

There were two pregnancy lossess after amniocentesis the first one amniocentesis done a 16 weeks gestation, three days later abortion induced because of chorioamnionitis, the second one, amniocentesis performed at 22 weeks gestation, presented second day of amniocentesis with spontaneous rupture of membranes, pregnancy terminated 26 days later as chorioamnionitis developed and the neonate 940 gms expired at age 14 days.

Amniotic fluid reports showed foetal karyotype abnormalities in 6 cases, one case trisomy(21), two cases trisomy(18), one trisomy(13), one case had unbalanced translocations and another of inversion of chromosome(6). Nine cases (10%) failed to culture. One fetus with structural congenital malformation and failed to culture was aborted electively. Three fetuses with structural abnormalities and normal karyotypes aborted spontaneously between 18-22 weeks. The two cases, one of unbalanced translocation and the other trisomy(21) were lost for follow up. The two cases, one of unbalanced translocation and the other trisomy(21) were lost for follow up.

The three neonatal deaths were all with structural abnormalities, delivery was at 28,29 and 36 weeks. Six of the eight still births as well with structural abnormalities and the other two both with severe intrauterine growth restriction and normal karyotypes at 30,32 weeks weighed 600 grams and 830 grams respectively.

**Comments:**

In this retrospective, descriptive study, we found the advanced maternal age continues to be the most common indication for genetic amniocentesis. A rising number of amniocentesis are being performed because of both improved ultrasonography and increasing use of maternal serum screening tests.

No records was kept of the number of needle punctures required or about the colour of the amniotic fluid, and this might have contributed to the high foetal loss rate as was reported by some to cause high rates of foetal loss(9,10,11).

No fluid could be obtained in one case where it was tired twice two weeks apart in the genetic amniocentesis group, 1 in 91 cases (1.1%), and in three cases (9.4%) in the Rh-isoimmunization group because of big anterior placenta and placental penetration was avoided as the physician experience was limited in these invasive procedures.

The foetal loss rate (defined as pregnancy loss within 30 days of the procedure) was 2.2% (2 cases out of 91 the genetic amniocentesis), as reported by Blesse and et al and in contrast to (0.3%) reported by Blackwell et al(12).
One of the two cases where foetal loss was attributed to the amniocentesis; she was known to be a high risk for foetal loss as she aborted three times before and she is a carrier of a translocation.

It was anticipated that increasing amniocentesis experience and improved ultrasound technology would make the procedure both easier to perform and safer for the fetus. Leschot et al (6, 13) reported a strong correlation between increasing operator experience and decreasing incidence of foetal death or abortion within the first 30 days of amniocentesis. Poor outcomes were particularly more common when the operator had performed fewer than 50 amniocentesis. Marthin et al (5) however, showed only a slight, and non significant, relationship between operator experience and pregnancy loss. A major deficiency of the study is the absence of a control group and lack of documentation of important points. The sample size was too small to conclude a real conclusion, but it serves to provide important insight into the role of experience in prenatal diagnostic safety.

References: