



## CHAPTER II

### LITERATURE REVIEW

Early amniocentesis has been generally performed before the 15th week of gestation. The initial results have suggested fetal loss rates and the complication of the procedure that are comparable to the second trimester amniocentesis(11-18).The technique for early amniocentesis is similar to the standard second trimester amniocentesis by using the ultrasound guidance technique(14-16). Success of obtaining fluid is surprisingly high and exceeds 95% in most reports. Assel and colleagues(19) compared outcomes of early amniocentesis versus second trimester amniocentesis ( table 1).The outcomes include the failed procedure, pregnancy and fetal outcome,were all similar in both groups.

TABLE 1. Compared outcome of early amniocentesis to standard amniocentesis.

Factor	Early Amnio.	Standard Amnio.
Failed sampling	5/300 (1.7%)	2/567 (0.4%)
Pregnancy loss less than 4 weeks	5/276 (1.8%)	2/542 (0.4%)
Pregnancy loss more than 4 weeks	1/271 (0.4%)	4/540 (0.7%)
Preterms birth	10/270 (3.7%)	35/537 (6.5%)
Perinatal death	7.4/1000	11.1/1000

Note all comparison not significant.

The quantity of amniotic fluid aspirated has been suggested to be 1 cc per week of gestation(20).The absolute amount of amniotic fluid volume for each week of gestation has been shown to exhibit a wide variation. As a practical guide the equation by Wagner(21) is representative of volume of amniotic fluid at 11-15 weeks of gestation.

$$V = 25(W-10)$$

V = volume ( 11- 15 weeks)

W = number of weeks since last menstrual period.

By this equation the amniotic fluid volume at 11-15 weeks are 25-125 cc.

A theoretical concern in early amniocentesis is that relatively more amniotic fluid is taken from the amniotic

fluid cavity in the first trimester than in standard amniocentesis and that this can cause fetal loss or deformity. By aspirating as little amniotic fluid as 1 cc per week of gestation which suggested to be the standards procedure in early amniocentesis, it has been postulated that the pregnancy and fetal complication rates will be minimized to be the same as the second trimester amniocentesis(20). However limiting the volume of aspirated amniotic fluid can cause low cell count, and this will be the factor that causes long duration of the culture time and higher failure rate. The failure rates for the cytogenetic evaluation in early amniocentesis were found to be in the range of 2.7%-20%, and extended culture duration time were in the range of 12.2-26 days(9,10,22).

An amnifiltration system has been developed allows the collection of more cells while removing only small volume of amniotic fluid, and it appears to achieve a high success rate for the cytogenetic outcome(23,24). A polyvinylidene difluoride filter membrane in the Sterivex filter has been shown to be nontoxic to the cell culture(25). Sunberg et al(26) have been reported 100 cases of amnifiltration technique by using the Sterivex filter from Millipore in 11-14 weeks of gestation. The fetal and pregnancy outcome is similar to those found in studies of

early amniocentesis. The advantage of this technique is shown through the improving of the culture quality. The colony counts were increased and the culture time was reduced to about 8 days. No culture failure occurred in this study.