The Effect of Prenatal Invasive Tests on Neonatal Birthweight

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ABSTRACT

OBJECTIVE: The aim of this study is to investigate the effect of prenatal invasive procedures on neonatal birth weight.

STUDY DESIGN: The present study consists of three group of pregnancies; 1) Amniocentesis group (n=97), 2) Chorionic Villus Sampling group (n=36), 3) Control group (matched patients without any intrauterine intervention, n=100). "Hacettepe University Perinatology Datae Base" is used in this study (January 2013-January 2014 interval is used for the extraction of datae). Singleton pregnancies without maternal complications (which may affect fetal birthweight) were included to this study. Exclusion criteria also includes cases with perinatal complications and fetuses with congenital abnormalities, cytogenetical problems and gene disorders. Consent forms were signed by patients prior to prenatal diagnosis and intrauterine interventions.

RESULTS: Matched patient groups were compared in terms of maternal age, gestational week and neonatal birth weight. We have demonstrated that "control" group and "chorionic villus sampling" group babies are statistically significantly heavier than "amniocentesis" group babies (p=0.01). The mean (±SD) birthweight values are 3009 ±428 gr, 3178±409 gr and 3283±358 gr for the "amniocentesis" group, "chorionic villus sampling" group and "control" group respectively. Decreased birthweight values in "chorionic villus sampling" group is not statistically significant. (p=0.74).

CONCLUSION: In this study, we have demonstrated that amniocentesis possibly influences the birthweight values. Decreased birthweight values may be due to the direct affect of amniocentesis itself through the depression and/or activation of various cytokines or growth factors, or the result of obstetrical problems behind the amniocentesis indications.

Keywords: Amniocentesis, Chorionic villus sampling, Neonatal birth weight

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Introduction

Amniocentesis (A/C) and chorionic villus sampling (CVS) are commonly used intrauterine interventions within the framework of prenatal diagnosis programs.[1-4] A/C causes uterine wall and placental membrane(s) injury together with amniotic fluid reduction. On the other hand, CVS causes uterine wall and chorionic villus injury which may end up with impaired maternal-fetal interaction. The question is the possible affect of these intrauterine interventions on placental development and intrauterine fetal growth. As far as we know, this study is the first study which searches the effects of A/C and CVS themselves on fetal growth by means of birthweights.

It has been reported that fetal growth and fetal birthweight are dependent on various peptides, growth factors, enzymes, cytokines etc.[5-10] However, there is also no study or limited knowledge demonstrating the effect of A/C and CVS on these biochemicals which may affect fetal growth and directly the birthweight values.

Material and Method

The present study consists of 3 groups of matched pregnancies; 1) A/C group (n=97), 2) CVS group (n=36), and 3) Control group (pregnancies without any intrauterine interventions, n=100). Consent forms are signed by patients before entering prenatal diagnosis program and intrauterine interventions. Necessary clinical datae were withdrawn from

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"Hacettepe University Perinatology Data Base" retrospectively (January2013-January 2014 period). Only singleton pregnancies without any perinatal complications are accepted to this study. Exclusion criteriae also covers the obstetrical complications which may affect the placental development and fetal growth as well as fetal genetical disorders (congenital abnormalities, cytogenetical disorders and gene mutation based hereditary disorders).

Results

Matched groups are compaired in terms of maternal age, gestational week at delivery and birthweight. There are no statistically significant difference inbetween groups in terms of maternal age and gestational week at delivery.

We have demonstrated that birthweights of A/C group babies are statistically significantly lower than the other groups (Table 1). Birthweights and related datae are also shown on table 1.

Discussion

In this study, we have demonstrated that A/C itself may affect placental development and fetal growth through birthweight measurements. This affect may be due to of A/C itself by means of uterine injury, membrane(s) puncture and amniotic fluid reduction. To our knowledge, this is the first study showing the relationship inbetween A/C and possible growth retardation. This affect may also be the result of biological facts behind amniocentesis indications. The questionable finding is the lack of any similar affect due to CVS where we also have uterine wall and placental injury but not membrane(s) puncture and amniotic fluid reduction.

It has been reported that various growth hormones, peptides, cytokines, enzymes, etc. are involved in proper maternal-fetal interaction including sufficient placental development and fetal growth [5-14]. Some of these biochemical may be influenced by A/C and may be the result of impaired intrauterine growth. Unfortunately, there is no finding/evidence at the literature to explain the possible affect of A/C related impaired biochemical rationals on fetal growth.

This preliminary clinical report may be a good reason to set up new studies to questioning the possible adverse affect of A/C on intrauterine life.

Prenatal İnvazif Testlerin Yenidoğan Doğum Ağırlığı Üzerine Etkisi

ÖZET

AMAÇ: Bu çalışmanın amacı, yenidoğan doğum ağırlığına prenatal invazif prosedürlerin etkisini araştırmaktır.

GEREÇ VE YÖNTEM: Bu çalışma üç gebelik grubundan oluşmaktadır; 1) Amniyosentez grubu (n=97), 2) koryon villus örneklemesi grubu (n=36), 3) Kontrol grubu (herhangi bir intrauterin müdahalesi olmayan hastalar, n=100). Bu çalışmada "Hacettepe Üniversitesi Perinatoloji Veri Tabanı" kullanılmıştır (Ocak 2013-Ocak 2014). Maternal komplikasyonu olmayan (doğum ağırlığını etkileyebilecek) tekiz gebelikler çalışmaya dahil edilmiştir. Dışlama kriterleri: perinatal komplikasyon, konjenital anomalili fetüs, sitogenetik sorunları ve gen bozukluğu varlığını içermekteydi. Prenatal tanı onam formları, intrauterin müdahaleler öncesinde hastalar tarafından imzalandı.

BULGULAR: Hasta grupları anne yaşı, gebelik haftası ve doğum ağırlığı açısından karşılaştırıldı. "Kontrol" ve "koryon villus örneklemesi" grubu bebeklerinin istatistiksel olarak "amniyosentez" grubu bebeklere göre ağır olduğu gösterildi (p=0,01). Ortalama (±SD) doğum ağırlığı değerleri "amniyosentez", "koryon villus örneklemesi" ve "kontrol" grubu için sırayla 3009 ±428 gr, 3178±409 gr ve 3283±358 gr idi. "Koryon villus örneklemesi" grubundaki ağırlık azalması anlamlı değildi (p=0,74).

SONUÇ: Bu çalışmada, amniyosentezin muhtemelen doğum ağırlığı değerlerini etkilediği gösterilmiştir. Azalan doğum ağırlığı, amniyosentezin kendisinin etkisi ile deprese olan veya artan çeşitli sitokinler, büyüme faktörleri ya da amniyosenteze neden olan altta yatan obstetrik nedenler olabilir.

Anahtar Kelimeler: Amniyosentez, Koryon villus örneklemesi, Yenidoğan doğum ağırlığı

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Table 1: Infant birthweights

Groups	Number	Mean	Median	Std.Deviation	Minimum	Maximum
Amniocentesis	97	3009.7	2980.0	428.61	1880.0	3960.0
CVS	36	3178.6	3240.0	409.5	2330.0	3950.0
Control (Without invasive testing)	100	3283.2	3300.0	358.7	2500.0	4240.0
Total	233	3153.2	3190.0	414.9	1880.0	4240.0

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