HEARING SCREENING TEST RESULTS OF NEWBORNS CONCEIVED BY ICSI: A RETROSPECTIVE STUDY OF TERTIARY REFERRAL CENTER

UMIT YASEMIN SERT¹, HATICE KANSU CELIK¹, FUAT EMRE CANPOLAT¹, GÜLSÜM KADıOĞLU SIMSEK¹, YAPRAK ENGIN USTUN¹

¹ UNIVERSITY OF HEALTH SCIENCE, ZEKAI TAHIR BURAK WOMAN'S HEALTH, EDUCATION AND RESEARCH HOSPITAL, ANKARA, TURKEY

OBJECTIVE:

- Considering the general population, 3% of living babies have at least one congenital anomaly at birth although genetic factors consist of the major part of these anomalies, it is postulated that ART is associated with several birth defects due to the way of treatment, factors associated with infertility, paternal and maternal characteristics.
- In literature, several scenarios were suspected related to increasing rate of birth defects, however the most accepted one is the lack of natural selection which might help to eliminate defective fetus.

- Assisted reproductive technologies (ART) especially intracytoplasmic sperm injection (ICSI) is considered to be associated with birth defects according to the studies. There are few reports on hearing screening tests of these babies. Therefore, increased risk of any birth defects due to the use of ICSI remains more significant in which sperm does not pass its natural barriers .
- Congenital hearing loss (CHL) is determined 2-3 infants per 1000 live births. this rate increases to 1-2% for the babies in neonatal intensive care unit (NICU). Early diagnosis is essential to improve social, emotional, cognitive development and language of infant which will effect the entire life quality

- Universal newborn hearing screening programme (UNHS) is mostly recommended worldwide instead of risk based selective screening to be able to prevent missed cases .
- Clinicians mostly uses otoacoustic emission (OAE) and auditory brainstem response (ABR) tests to asses hearing related problems of newborns.
- OAE usually takes about 1 minute and does not need audiological expert. OAE particularly assess cochlear function.
- ABR is able to determine the impairment of cochlea, eighth nerve and auditory pathway trough brainstem and needs auditory expertise to be applied and interpreted. ABR can discriminate the conductive problems which can impairs OAE inaccurately from cochlear abnormalities .

- Risk factors for neonatal hearing impairement (NHI) are family history, congenital infections, craniofacial anomalies, low birth weight, hyper-bilirubinemia, ototoxic medications, bacterial meningitis, low apgar scores, mechanical ventilation for at least five days and syndromes associated with hearing loss were determined by the joint committee on infant hearing (JCIH).
- We aim to determine the association between assisted reproductive technologies and hearing loss of newborns.

MATERIAL AND METHODS:

- This retrospective study was undertaken using medical records of mothers who have successful IVF cycles in our hospital and had pregnancies ended with living neonates between january 2013 and december 2017.
- The newborn hearing screening datas were collected if performed and possible to acquire.
- This study was approved by ethical comitee of institutional review board of university of health science, Zekai Tahir Burak Women's Health and Research hospital (10.01.2019*1)



- We have used the data collection system of national neonatal hearing screening programme (NNHSP) for the women who did not give birth in our hospital while pregnancy occurred in our infertility department.
- Two kinds of screening protocol were used to screen newborns. These techniques are transient evoked otoacoustic emission (TEOAE) and auditory brainstem response (ABR).

RESULTS:

- Between 2013 and 2015, we could reach the national hearing screening results of 246 ICSI conceived newborns.
- It is found that 10% of these new-born (25/246) could not pass the first examination while 4% of the infants (10/246) failed from the second step evaluation with four ABR and six TOAE.
- Fourteen of the cases were twin (14/246) while 12 of these twins were preterm.
- When we consider the whole study population seventeen of the newborns (17/246) were early preterm (between 27-32 weeks), 42 of newborns (42/246) were late preterm (32-37 weeks).



- One case is complicated with congenital glaucoma, one with patent ductus arteriosus (PDA), 2 infants with preeclampsia, one with placenta previa, and one with cleft palate and lip while none of these cases was associated with NHL.
- The incidence of NHL was 4% (10/246) within the ART babies and 2% (5/246) when we rule out the infants with identified risk factors.
- We could not reach the further evaluation of babies as none of the failed tests were applied in our hospital.

Table 1. Obstetric and newborn outcomes		
Variable	n	%
Twin pregnancy	14	5.7
Early preterm (27-32 weeks)	17	6.9
Late preterm (32-37 weeks)	42	17
Pre-eclampsia	2	0.8
Placenta previa	1	0.4
Congenital glaucoma	1	0.4
Patent ductus arteriosus	1	0.4
Cleft palate and lip	1	0.4



CONCLUSION:

- In conclusion, hearing screening tests expose distorted results in 4% of ICSI babies which is ten times more when compared with spontaneously conceived newborns. Babies should be assessed in terms of hearing loss carefully after ART.
- The prevalence of low risk art babies in terms of NIH is about 2% which is quite higher from literature. ART might be considered as a risk factor for NIH and these babies should be evaluated with the approaches applied to risky population.