

VIII. STRESZCZENIE W JEZYKU ANGIELSKIM

Statistically, 1-2 babies out of 1,000 are born with profound or severe damage to the hearing organs. In the most important stage of a child's speech development, between the age of 0 and 5, approximately 90% have congenital hearing loss. The critical period for the process of acquiring speech is up to 6 months of age, and by that time the newborn's hearing impairment should be diagnosed. The JCIH guidelines assume that the problem will be diagnosed up to the age of 3 months. Early fitting of hearing aids in the case of mild to moderate hearing loss, qualification for implant placement in a child with severe and profound damage should take place before the age of one. Early audiological diagnosis in the neonatal period is associated with a number of activities specified in the Universal Newborn Hearing Screening. Hearing screening and classification of risk factors for hearing damage in newborns, are aimed at distinguishing newborns with the risk of damage to the hearing organ and providing them with specialist care.

The research was carried out at the Department of Neonatology and Neonatal Intensive Care at the University Clinical Hospital of Bialystok in 2010-2017. The tests were prepared on the basis of Neonatal Charts and Hearing Screening Charts. The research group consisted of 15,030 live born newborns, including 7,712 boys (51.31%) and 7,318 girls (48.69%). Newborns were screened for hearing with the otoacoustic emission method under the Universal Newborn Hearing Screening and an interview regarding risk factors for hearing loss.

The aim of this study was to analyze the sociodemographic trends and the variability of the risk factors for hearing impairment in newborns under the care of the Department of Neonatology and Neonatal Intensive Therapy of the University Clinical Hospital of Bialystok over the years 2010-2017. The main assumptions of the study concerned the assessment of the influence of sociodemographic factors on the occurrence of risk factors and the assessment of correlations between risk factors, and then the assessment of the risk of hearing impairment in newborns with the presence of one or more risk factors. The research was also aimed at demonstrating the effectiveness of the implementation of the Universal Newborn Hearing Screening in newborns staying at the Department of Neonatology and Neonatal Intensive Therapy of the University Clinical Hospital of Bialystok in the years 2010-2017.

On the basis of the conducted research, statistically significant differences were shown in demographic data such as: sex, place of residence, mother's age, number of pregnancies and deliveries, previous miscarriage, gestational age, hypotrophy, birth length and Apgar score. There was an increase in the frequency of risk factors for hearing damage from 13.51% to 20.50% in the years 2010-2017 in the study group, moreover, the maximum number ($n = 7$) of risk factors per newborn was found. In the years 2010-2017, statistically significant differences were shown in the variability of the occurrence of risk factors such as: ototoxic drugs, TORCH infection, prematurity <33 weeks of pregnancy, family hearing impairment, Apgar <4 points in 1 minute or <6 points in 5 minute, artificial ventilation >5 days, intensive therapy >7 days, birth weight <1500 g and a congenital defect of the head or neck.

There were statistically significant differences between the occurrence of risk factors for neonatal hearing loss and individual variables: maternal origin, number of pregnancies and deliveries, hypotrophy and Apgar score. There were statistically significant differences in gestational age, birth weight and length between newborns with one or more risk factors and those without a risk factor. There were statistically significant differences between the use of ototoxic drugs in the newborn and gender, maternal origin, number of pregnancies and deliveries, occurrence of hypotrophy, Apgar score, gestational age, birth weight and body length. Statistically significant correlations were found between the incidence of TORCH infection and maternal miscarriage and the Apgar score. There were statistically significant correlations between the incidence of prematurity in the newborn and the mother's origin, hypotrophy, Apgar score, gestational age, birth weight and body length. There were statistically significant differences between the occurrence of a low Apgar score of <4 points in 1 minute or <6 points in the 5th minute of a newborn's life and hypotrophy, gestational age, birth weight and length. There were statistically significant relationships between the use of artificial ventilation >5 days and maternal origin, prior miscarriage, Apgar score, gestational age, birth weight and length. Statistically significant correlations were found between the neonate's stay in intensive care >7 days and the mother's origin, hypotrophy, Apgar score, gestational age, birth weight and body length. Statistically significant correlations were found between the birth weight of the newborn <1500 g, the mother's origin, the number of pregnancies and deliveries, hypotrophy, Apgar score, gestational age and birth length. There were statistically significant differences between the incidence of congenital malformations associated with hearing loss and the number of pregnancies and deliveries, hypotrophy, Apgar score, maternal age, gestational age, birth weight and body length. There were statistically

significant correlations between the occurrence of congenital anomalies of the head and neck and the sex of the newborn, hypotrophy, birth weight and length, as well as between the occurrence of meningitis and the gestational age, birth weight and length.

There were statistically significant differences between the gestational age, birth weight and length of newborns and the number of risk factors for hearing loss in 2010-2017. Based on the analysis of the relationship between risk factors for hearing loss, statistically significant relationships were shown between the use of ototoxic drugs in the newborn and prematurity <33 weeks of gestation, a low Apgar score of <4 points in 1 minute or <6 points in the 5th minute of life, artificial ventilation lasting >5 days, stay in the neonatal intensive care unit >7 days, birth weight <1500 g, the presence of congenital anomalies with hearing loss, jaundice requiring exchangeable blood transfusion and meningitis. There were statistically significant differences between the incidence of TORCH infection and prematurity <33 weeks of gestation, stay in the neonatal intensive care unit >7 days and birth weight <1500 g. Statistically significant differences were found between the occurrence of prematurity <33 weeks of pregnancy and a low Apgar score <4 points in 1 minute or <6 points in 5 minutes, with artificial ventilation >5 days, stay in the neonatal intensive care unit >7 days, birth weight <1500 g and meningitis.

Based on the obtained results, an increasing tendency of the risk of hearing loss in newborns in the group of mothers giving birth after age 30 and the number of births per one mother in 2010-2017 was demonstrated. Moreover, an increase in the percentage of all risk factors for hearing impairment in the examined newborns was demonstrated. In 2010-2017, there was a decrease trend in the occurrence of the following risk factors for hearing damage: ototoxic drugs, prematurity <33 weeks of gestation, Apgar score <4 points in 1 minute or <6 points in 5 minutes, artificial ventilation >5 days, intensive therapy >7 days and birth weight <1500 g. On the other hand, there was an upward trend in the incidence of TORCH infection and congenital head or neck defect over the analyzed years. The correlation between sociodemographic data and the occurrence of individual risk factors for hearing damage was confirmed, and significant correlations between individual risk factors for hearing damage in the studied group of newborns were demonstrated. A decrease in the risk of hearing damage in newborns was demonstrated at the Department of Neonatology and Neonatal Intensive Care of the University Clinical Hospital of Białystok in 2010-2017. The preventive effectiveness of the Universal Newborn Hearing Screening has been demonstrated.

Key words: newborn, hearing test, risk factors, hearing loss, early intervention

