The Structure of Neural Tube Defects in the Crimean Population

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Background and Aims

Neural tube defects (NTDs) are the second most common type of birth defect after congenital heart defects. Neural tube defects represent a complex trait with multifactorial etiology encompassing both genetic and environmental components. Our aim was to analyze the features of NTDs and risk factors leading to them.

Methods This population-based study was conducted in Crimean Genetic Center from 2002 to 2017. Clinical, radiological, pathological and survival data were gathered.

Results Our sample database consisted of 325 NTD cases, comprised of 141 (43,4%) males and 183 (56,3%) females. Anencephaly presented in 70 (21,5%) cases. SB was evident in 254 cases, categorized by: myelomeningocele – 85 (26%), encephalocel -61(18%), meningocele – 60 (17%), spinal dysraphism - 49 (15%), spina bifida occulta – 9 (3%). Myelomeningocele cases were identified according to the location of lesions: neck – 5 (1.3%), thoracic– 16 (2.4%), lumbar – 59 (27.1%), sacral – 47 (18.5%), combined lesions: neck-thoracic – 4 (0.39%), thoracic-lumbar – 40 (15.4%), lumbar-sacral – 75 (29.5%), thoracic-lumbar-sacral – 8 (3.1%). Folate deficiency before and during pregnancy was evident in 180 (70.1%) cases. Other risk factors include smoking – 32 (9,8%), obesity – 28 (8,6%), poorly controlled diabetes – 19 (5,8%), urogenital infections – 17 (5,2%) and ant seizure medication – 15 (4,6%). It is important to note that term than FA intake began is crucial for fetus. The first subgroup (1-13 weeks) comprised 58 (11,4%) female, the second subgroup (14-27 weeks) included 26 (22,2%) women, the third subgroup (28-42 weeks) consisted of 4 (11%) female. The logistic regression model revealed the lack of FA preparation before pregnancy and lost important period of neural tube development to be significant negative predictors. Furthermore, the medium dose of folic acid during pregnancy was 0.8 mg.

Conclusion The national nutrition survey concluded that the average intake of folic acid from food does not cover the amount needed. Intervention programs should be promoted to increase folic acid intake. Optimal FA intake was found to be low in this Crimean population, highlighting the need of health education and adequate staple food fortification.

FA intake during pregnancy 44,6%

Other risk factors NTDs and FA intake