Title: ZYGOSITY DIAGNOSIS IN YOUNG TWINS-NON-INVASIVE METHOD OF GENETIC DETERMINATION

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OBJECTIVE: To clarify genetic determination of zygosity in twins of childhood age using non invasive methods.

DESIGN: The subjects were 33 healthy twin pairs in 7 – 15 y and their mothers. To preliminary determine the degree of similarity of twins to all mothers was sent the questionnaire based on Baonnelykke et al. and modified by Oki et al. To determine zygosity by DNA similarity the sample of twin’s saliva were analyzed using Perkin Elmer GeneAmp PCR System 240. After amplification DNA samples were denaturated, then hybridized to the nylon strips with colorimetric detection. The phenotypes of 6 biallelic genetic markers such as: HLA DQA1, LDLR, HBGG, GC, GYPA and D7S8 were analyzed. Further, data from genetic and questionnaire diagnostic tests were compared using STATISTICA tests.

RESULTS: According to the assessment of concordance or disconcordance in genetic material from twins (11 MM, 17 FM, 5 FF ) 14 pairs were classified as monozygotic and 19 pairs as dizygotic twins. In our differentiation of genetically analyzed dizygosity the HBGG and GC genetic markers possessed the biggest contribution. The correlation rate between genetically determined MZ and the questionnaire assessment of “identical color of iris, color of hair and feature of the twin’s face” done by mothers was significantly high (r= 0.85).

DISCUSSION: For zygosity diagnosis both non-invasive methods are useful. The three features in the questionnaire applied in our investigation belong to the most strongly genetically determined features, though it is possible that increased number of questions for genetically determined features would improve the correlation.

CONCLUSIONS: According to our results we can recommend saliva as a good biological material for diagnosis of zygosity, as it is stable after drying for a long time and it could be stored in ambulatory conditions. Only small amount of DNA are needed (10 – 30 pg) for investigation. We recommended both methods especially among children population.