**ASSOCIATIONS BETWEEN ABCB1 AND ABCG2 GENE POLYMORPHISMS OF CHILDREN AND ISOLATED SEPTAL DEFECTS IN A HAN CHINESE POPULATION**

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*Background*: Substantial epidemiological data have demonstrated that several toxicants/drugs exposures periconceptionally could increase the risk of congenital heart defects (CHDs). Placental P-glycoprotein (P-gp) and breast cancer resistance protein (BCRP), encoded by the ABCB1 and ABCG2 gene in human, play an essential role in regulating fetal exposure to toxicants/drugs.

*Purpose*: This study aimed to explore the associations between ABCB1 and ABCG2 gene polymorphisms of children and isolated septal defects in a Han Chinese population, and to investigate the impact of these polymorphisms on expression of placental P-gp and BCRP, respectively.

*Methods*: An age and gender matched case-control study involving 210 pairs was conducted. Genotyping of ABCB1 and ABCG2 gene polymorphisms were conducted by sequencing. Forty-six placenta tissues and umbilical cords from healthy Han Chinese mothers with uncomplicated pregnancy were collected. Placental P-gp and BCRP mRNA and protein expression were determined by real-time quantitative PCR and western-blot.

*Results*: For ABCB1 gene 3435C>T polymorphism, more cases were carriers of the CC/CT genotypes (OR: 2.0, 95%CI: 1.1¨C3.5, P-value: 0.021). For the ABCG2 gene 34G>A polymorphism, more cases were carriers of the GA/AA genotypes (adjusted OR: 1.6, 95%CI: 1.0-2.3). There were no differences in the genotype distributions and allele frequencies of ABCG2 gene 421C>A polymorphism. The placental ABCB1 mRNA and protein expression of the TT genotype were significantly higher than that of the CC genotype. The ABCG2 mRNA and protein expression did not differ among the three genotypes of 421C>A polymorphism. For 34G>A polymorphism, the ABCG2 mRNA and protein expression of the GG genotype was significantly higher than that of the AA genotype.

*Conclusions*: The 3435C>T polymorphism within the ABCB1 gene and 34G>A polymorphism within the ABCG2 gene of the children are associated with isolated septal defects in a Han Chinese population, presumably through regulation of placental P-gp and BCRP expression, respectively.