学位の種類	博士（医学）
報告番号	甲第１６６６号
学位記番号	第１１８３号
氏名	川瀬　恒哉
授与年月日	平成 31 年 3 月 25 日
学位論文の題名	Single nucleotide polymorphisms in AGTR1, TFAP2B, and TRAF1 are not associated with the incidence of patent ductus arteriosus in Japanese preterm infants. (AGTR1, TFAP2B, TRAF1 の一塩基多型は日本人早産児の動脈管開存症の発症には関与しない) Pediatrics International. Vol.58 : P.461-466, 2016
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Persistent patent ductus arteriosus (PDA) is a frequent complication in preterm infants. Single nucleotide polymorphisms (SNP) in several genes, including angiotensin II receptor, type 1 (*AGTR1*), transcription factor AP-2 beta (*TFAP2B*) and tumor necrosis factor receptor-associated factor 1 (*TRAF1*), have been reported to be associated with PDA in preterm infants. The aim of this study was to evaluate the relationships between PDA in preterm infants and polymorphisms in *AGTR1*, *TFAP2B* and *TRAF1* in the Japanese population. The subjects consisted of 107 preterm infants with gestational age <32weeks. Extremely low-birthweight infants were treated with prophylactic indomethacin during the first 24 h after birth. Five SNP, namely, rs5186 in *AGTR1*, rs987237 and rs6930924 in *TFAP2B*, and rs1056567 and rs10985070 in *TRAF1*, were genotyped using TaqMan SNP genotyping assays. There were no significant differences in the distributions of the genotypes and allele frequencies of all studied SNP between the PDA group (n = 46) and the non-PDA group (n= 61). There were no significant associations between the studied SNP and the incidence of PDA in Japanese preterm infants. These SNP may not be clinically important predisposing factors for PDA in Japanese preterm infants.