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Are Gene polymorphisms of Fibroblast Growth Factor 10 associated with Patent Ductus Arteriosus and Bronchopulmonary Dysplasia in extremely low birth weight infants?

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Background

FGF10 expression and lung bud morphogenesis

- FGF10 signaling pathway
- Roles of FGF 10 –
  - Fibroblast growth factor 10 (FGF10) plays a significant role in cardiac outflow tract formation and possible PDA. Downregulation of the FGF/Ras/Erk pathway are important for the differentiation of the progenitors and colonization of the cardiac outflow tract. FGF10 is also an integral part of the signaling required for distal lung branching morphogenesis in fetus. It is an alveolar epithelial cell (AEC) mitogen protects against cyclic stretch and oxidant injury via DNA repair. It regulates the mitogen activated protein kinase (MAPK) that, in turn activates the Na-K-ATPase in AEC - protein responsible for fetal lung fluid resorption and lung fluid resorption and Na, K-ATPase

Demographic Characteristics- PDA

- GA (wk; median;IQR) 25 (24, 26)
- BW (gm; mean± SD) 742±171
- Prenatal Steroid 52(78%)
- Female Gender 32(49%) Non Hispanic White 17(29%)
- Non Hispanic Black 15(26%)
- Hispanic 22(38%)
- Other 4(7%) Non Hispanic White 17(29%)
- Non Hispanic Black 15(26%)
- Hispanic 22(38%)
- Other 4(7%) Genotype Distribution -PDA

- Genotyping Analysis:
  - FGF10 SNPs Analysis:
  - DNA was isolated from buccal swabs and real-time PCR was performed using Taqman probes

FGF10 SNPs -
- rs2973644, rs900379, rs1011814

Conclusions

- Low birth weight and gestational age was associated with BPD
- FGF10 SNP ; rs2973644, rs900379, rs1011814 were not associated with PDA and or BPD.
- Other SNPS may be involved in the susceptibility of PDA or BPD

References


Financial disclosure: No Commercial Support

Hypothesis

- ELBW infants (birth weight < 1kg)
- Informed parental consent
- Low birth weight and gestational age was associated with BPD

Methods

- Inclusion criteria:
  - ELBW infants (birth weight < 1kg)
  - Informed parental consent
- FGF10 SNPs Analysis:
  - DNA was isolated from buccal swabs and real-time PCR was performed using Taqman probes

Results

- BPD defined by the need for oxygen supplementation at 36 weeks post menstrual age.
- Statistics: Student’s t-test, Chi-square, Mann-Whitney, z-test; P<0.05

FGF10 SNPs Analysis:
- rs2973644, rs900379, rs1011814

Genotype Distribution-BPD

- Wild allele 9(31%) 17(41%)
- Heterozygous 15(48%) 15(39%)
- Minor allele 14(48%) 20(48%)
- Any variant allele 20(68%) 42(85%)

Patent Ductus Arteriosus

- Associated with susceptibility to PDA and or BPD.
- Other SNPS may be involved in the susceptibility of PDA or BPD

Genotype Distribution-BPD

- Wild allele 19(58%) 22(49%)
- Heterozygous 7(21%) 14(31%)
- Minor allele 7(21%) 9(20%)
- Any variant allele 14(42%) 23(55%)

Demographic Characteristics- BPD

- GA (wk; median;IQR) 26 (25, 27)
- BW (gm; mean± SD) 761±143
- Prenatal Steroid 42(76%)
- Female Gender 18(60%)

FINANCIAL DISCLOSURE: No Commercial Support