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ALTERED EXPRESSION OF TRANSFORMING GROWTH FACTOR-\( \beta \)1 IN THE HEART OF NITROFEN INDUCED DIAPHRAGMATIC HERNIA IN RATS

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Purpose: Human and experimental studies have demonstrated that heart weight is significantly reduced in the presence of congenital diaphragmatic hernia (CDH). The possible role of cardiac maldevelopment in the high mortality of these infants has been suggested. The transforming growth factor-beta (TGF-beta) family belongs to a superfamily of related proteins, which affect cell growth. Recent evidence from in vivo studies indicates that TGF-beta1 acts an important in early and late fetal development of the heart. The aim of this study was to determine the gene level expression of TGF-beta1 in the heart of nitrofen induced CDH using reverse-transcription polymerase chain reaction technique (RT-PCR).

Methods: Congenital diaphragmatic hernia (CDH) was induced in pregnant rats following administration of 100 mg nitrofen on day 9.5 gestation (term 22 days). In control animals, the same dose of olive oil was given without nitrofen. Cesarean section was performed on day 21 of gestation. The fetuses were divided into three groups: normal controls (n=16), nitrofen induced without CDH (n=16) and nitrofen induced CDH (n=16). Total RNA, DNA were extracted from the heart in each group and measured. mRNA was extracted from total RNA. RT-PCR was performed to evaluate mRNA expressions of TGF-beta1. Levels of mRNA were expressed as a ratio of the band density divided by that of beta-actin, a house-keeping gene known to be expressed at a constant level.

Results: TGF-beta1 mRNA expression was significantly decreased in CDH heart (0.380± 0.171) compared to controls (0.718± 0.263) (p < 0.01) and nitrofen induced without CDH heart (0.620± 0.155) (P<0.01).

Conclusion: These results indicate that the downregulation of TGF-beta1, may be involved in the pathogenesis of cardiac hypoplasia in nitrofen induced CDH.