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Role of COX-2 gene in Idiopathic preterm birth with reference to Organochlorine pesticides: A case control study

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Abstract

Cyclooxygenase-2 (COX-2) is the key enzyme for prostaglandin synthesis. Recent studies suggest that exposure to organochlorine pesticides like DDT in in-vitro models dose dependently increase COX-2 gene expression. This increases prostaglandin synthesis, resulting in onset of preterm labor (PTL). The present study was conducted to investigate the possible association of organochlorine pesticides on COX-2 gene expression in the pathogenesis of PTL. Maternal blood and placenta were collected at the time of delivery from 50 'idiopathic' preterm cases and 50 term controls. All subjects had singleton pregnancy and intact membranes. COX-2 gene expression in blood was estimated by Real Time PCR and levels of organochlorine pesticides in blood and placenta, by Gas Chromatography. A statistically significant overexpression of COX-2 gene (3.3 times) was seen in preterm cases compared to term controls. High levels of pesticides- α, β- HCH and DDE were associated with preterm onset of labor; with α- HCH increasing the odds of preterm delivery 2.86 times. Significant interaction was observed between high levels of β-HCH and overexpression of COX-2 gene, resulting in reduction of period of gestation by 10 days. A considerable amount (more than 60%) of placental transmission of pesticides was also seen. It was concluded that high levels of pesticides may result in preterm birth by increasing the expression of COX-2 gene. COX-2 inhibition thus, may have a role in prevention of PTL. This study can be a basis for future research that can look into formulation of safe and better COX-2 inhibitors (like natural COX-2 inhibitors) as preventive strategy for PTL.

Biography

Neha Garg is a 3rd year junior resident in department of Obstetrics and Gynecology in UCMS, University of Delhi, India. She completed her MBBS in the year 2011 from LLRM Medical College, Meerut, India. She has received many gold medals during her MBBS course. Two of her papers are under consideration for publication in international journals of high repute. She has attended various national and international conferences, and has also presented many seminars and oral presentations. She has also assisted in examination of many medico-legal cases in the department and has helped in decision making.