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Production of sex steroid androgens in lung maturation: The battle of the sex

Sex steroids and in particularly androgens are known regulators of lung development. Respiratory failures are crucial problem in case of premature births. Respiratory distress syndrome (RDS) is the leading cause of morbidity in preterm neonates. RDS occurs with a higher incidence in males and the unique etiologic factor is the presence of androgens in male lungs. The mechanisms underlying the effects of androgens on lung development and on the occurrence of RDS are only partially deciphered. Using several models and approaches, data will be presented, indicating that the lung is a very active steroidogenic tissue where androgens are synthesized in both male and female fetuses. In vivo data indicate that the production of androgens by the fetal lung overlaps the gestation window when alveolar Type II cells emerge. Data also indicated the presence of a delay between male and female lung. The fact that androgen-synthesizing enzymes are expressed in male and female fetal lungs, indicate a physiological role for androgens in lung development. Besides, negative effects of androgens on lung development occur and are evidenced by the delay in the surge of surfactant synthesis for males. Coexistence of physiological and pathological androgen effects in lungs is novel and makes much more complex the approach of androgen elimination as mean to abrogate the androgen-specific disadvantage in male compared to the female. Androgen-dependent modifying enzymes may also play on corticosteroids with consequences that their mechanism of actions is changed. In summary, molecular biology studies of steroidogenic enzymes indicate that the optimal response of the lung to prenatal corticosteroid administration is much more complex than previously suspected.

Biography

Yves Tremblay is a full professor at Laval University and in the Department of Obstetrics/Gynecology. He obtained his bachelor's in 1980 and his Ph.D. in 1984. From 1985 to 1990, he pursued his post-doctoral training at the Louis Pasteur University in Strasbourg, then at the UCSF. In 1990, he became professor at Laval University. He is recognized by the FRQS as a career research professor. He is also a member of Université Laval's Centre de recherche en biologie de la reproduction. He is the director of the Québec's Respiratory Health Network. He is also a member of the Board of Directors of the Quebec Lung Association.

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