11-oxygenated androgens may be related to the virilization of female external genitalia due to the maternal androgen-producing adrenal tumor.

**Background**

- **Matureization of the external genitalia in humans** is dependent on the formation of DHT through both the classical androgenic pathway and an alternative (backdoor) pathway. Backdoor pathway has been reported for the virilization of female patients with 21-hydroxylase deficiency (21-OHD) and cytochrome P450 oxidoreductase deficiency.
- Moreover, recent studies have demonstrated higher than normal circulating levels of 11-oxygenated 19-carbon steroids (11oxC19) in patients with 21-OHD.

**Methods**

- **Maternal androgens measurement**
  - Serum DHEA-S and androstenedione (EIA)
  - Urinary steroid profiles (GC/MS)
  - Serum T, DHT, 11α-C19 and backdoor pathway products (LC/MS/MS)

**Results**

- **Clinical significance of 11oxC19**
  - Various androgen levels in the circulation of female infants due to the maternal androgen-producing adrenal tumor.

**Discussion & Conclusions**

- Placental aromatase converts excess androgen from the mother into estrogen, protecting it from fetal androgen exposure. However, 11oxC19s are nonaromatizable androgens, leading to fetal external masculinization.
- This is the first report of the involvement of 11oxC19, in addition to the classical and alternative pathways, in the fetal external masculinization.
- 11KT is the dominant androgen involved in the virilization of female external genitalia due to the maternal androgen-producing adrenal tumor.

**Selected References**