Background: One of the common pathologic pregnancies in obstetrics is early abortion. The CBA×DBA/2 mating have been widely accepted as a classical abortion model. The aims of this study were to investigate the expression of cystic fibrosis transmembrane conductance regulator (CFTR) and the epithelial sodium channel alpha subunits (ENaC-?) in the deciduas of CBA×DBA/2 model and in clinical early miscarriage patients.

Methods: The CBA×DBA/2 mating (n=10) represents the abortion group, while the CBA×BALB/C combination (n=11) was used as control group. Normal pregnancy samples (n=24) were obtained from elective pregnancy terminations, while abnormal deciduas (n=20) were obtained from women with the first trimester miscarriage. The human deciduas were all aged between 6 and 10 week of gestation, and the mice deciduas were collected on day 13.5 of pregnancy. The expression of CFTR and ENaC-? were analyzed using quantitative real-time PCR, immunohistochemistry and western blotting.

Results: In our investigation, we observed an statistically significant increase of the abortion rate in the CBA×DBA/2 mating compared to the CBA×BALB/C combination (22.22% versus 5.00%, P < 0.05). Here we demonstrated for the first time that the deciduas of abortion prone CBA mice (DBA/2 mated) had higher CFTR mRNA and protein expression, and lower ENaC-? mRNA and protein expression, compared to normal pregnancy CBA mice (BLAB/C mated). Furthermore, increased CFTR expression and decreased ENaC-? expression were also observed in uterine from early miscarriage women as compared to those with successful pregnancy.

Conclusions: The present study reveals a previously undefined role of CFTR and ENaC-? in early miscarriage. Increased CFTR expression and decreased ENaC-? expression in the abortion prone deciduas may underline the involvement of the molecular mechanism in regulation of early pregnancy.