Coronavirus disease, COVID-19, caused by SARS-CoV-2 virus is ongoing global problem. It has been shown that pregnant women are at greater risk for a severe illness. Moreover, the infection may lead to the massive placental damage i.e. trophoblast necrosis and inflammation. SARS-CoV-2 infection is also proposed to be a risk factor for early pregnancy loss. Extravillous trophoblast cells are specific cells of the placenta that invade maternal uterine tissue and are in direct contact with maternal circulation. Trophoblast invasion is essential process for the establishment and maintenance of pregnancy, while matrix metalloproteinases (MMP) -2 and -9 are among crucial molecular mediators.

This pilot study was designed to investigate the possible effects of maternal sera obtained within three months from COVID-19 on the trophoblast cell function. Sera from eight women of reproductive age positive for IgM towards SARS-CoV-2 were used to treat extravillous trophoblast cell line HTR-8/SVneo. Sera from healthy age-matched women were used as control.

**Results**

- Cells- Extravillous trophoblast cell line HTR-8/SVneo derived from first trimester placental tissue explants was used as a model.
- HTR-8/SVneo cells were treated for 24 h with 5% SARS-CoV2 IgM- or IgM+ serum.
- Cell viability was assessed by MTT assay.
- Cell migration was measured using a wound healing „scratch“ assay.
- The expression of MMP-2 and MMP-9 at mRNA level was assessed by qPCR.
- Relative protein levels of MMP-2 and MMP-9 in HTR-8/SVneo cell lysates were determined by SDS-PAGE gelatin zymography.

**Conclusion**

The results of this pilot study suggest the potential negative effect of maternal COVID-19 on the trophoblast cell function and hence on the placentation process which could lead to pregnancy loss or intrauterine growth restriction. However, these findings need further verification using a larger number of sera and a confirmation in vivo.