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Seroprevalence of SARS-CoV-2 antibodies among pregnant women in Estonia: a call for epidemiological studies

Sir,

On April 7, 2020 Mehreen Zaigham and Ola Andersson published a systematic review of maternal and perinatal outcomes in 108 pregnancies with Covid-19 concluding that careful monitoring of such pregnancies and is warranted.[1] We would like to emphasise the need to assess objectively the impact of the novel Severe Acute Respiratory Coronavirus Type 2 (SARS-CoV-2) causing Covid-19 disease on pregnancy and perinatal outcomes by conducting epidemiological studies among pregnant women.

Almost all persons infected with SARS-CoV-2 test positive for antiviral immunoglobulin type G (IgG) antibodies 10-20 days after being infected.[2] The proportion of seropositive persons among pregnant women has been used as a proxy of the disease prevalence among the general population.[3,4] In Spain, the population-based seroprevalence of SARS-CoV-2 for the period of April 27 to May 11 was 4.6%.[5]

During the Covid-19 pandemic, the routine 1st trimester combined screening (OSCAR test) was temporarily replaced by non-invasive prenatal screening test (NIPT) for all pregnant women in Estonia from March 13 to May 18, 2020. Blood samples used for NIPT were collected in The

Competence Centre on Health Technologies and the serum residuals of 433 women were used for detecting SARS-CoV-2 IgG antibodies in SYNLAB Estonia using the chemiluminescent microparticle immunoassay (CMIA) technique on ARCHITECT i2000SR. The IgG antibody level above 1.4 Index (S/C) was defined as a positive result. The study was approved by Research Ethics Committee of the University of Tartu (decision No 315/T-20, May 18, 2020). The study was funded by the Estonian Research Council (grants No IUT34-16 and IUT34-17).

For the current analysis, the residual blood samples from NIPT testing were collected during the period from May 4 to June 10, 2020. Participants represented all regions in Estonia. The mean age of study participants was 31 years (SD 5.89), mean duration of pregnancy at the time of testing 11 gestational weeks (SD 2 weeks), and mean BMI of women was 24.53 (SD 0.31). Only two women (0.46%) tested positive for SARS-CoV-2 IgG antibodies.

The cumulative incidence of SARS-CoV-2 RNA positive cases from nasopharyngeal swabs by April 17, 2020 among the general population aged 30-34 years in Estonia was 9.9 per 10,000 (the cumulative number of all positive tests by April 17, 2020 was 1510 (3,8%) of 39 583 tests with 60% of tests taken from females and 55% of positive tests among females)). The seroprevalence among pregnant women of the same age about a month later in our study was nearly five times higher. It suggests that serologic methods can be more informative of the disease burden than case based viral nucleic acid testing from nasopharyngeal swabs using PCR..

In comparison with available data from Spain,[9] seroprevalence of SARS-CoV-2 antibodies among pregnant women in Estonia was 10 times lower than among the general population in Spain indicating the possibility of regional differences in the incidence of COVID-19 across Europe. In Estonia, this epidemic is well contained so far with no excess mortality due to COVID-19.

In conclusion, serological studies among pregnant women could not only be useful in following the trajectory of the COVID-19 epidemic within a country, but also provide a more standardised way to compare the burden of infection among different countries. Only well-planned and well-conducted epidemiological studies among pregnant women will allow to find out the real effect of the SARS-CoV-2 virus on perinatal outcomes.

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References

1. Zaigham M, Andersson O. Maternal and perinatal outcomes with COVID-19: A systematic review of 108 pregnancies. Acta Obstet Gynecol Scand 2020;99:823-829.
2. Long QX, Liu BZ, Deng HJ, et al. Antibody responses to SARS-CoV-2 in patients with COVID-19. Nat Med. 2020;26:845-848.
3. Chin J. Public health surveillance of AIDS and HIV infections. Bull World Health Organ. 1990;68:529–536.
4. Kitojo C, Gutman JR, Chacky F, et al. Estimating malaria burden among pregnant women using data from antenatal care centres in Tanzania: a population-based study. Lancet Glob Health. 2019;7:e1695-e1705.
5. Pollán M, Pérez-Gómez B, Pastor-Barriuso R, et al, on behalf of the ENE-COVID Study Group. Prevalence of SARS-CoV-2 in Spain (ENE-COVID): a nationwide, population-based seroepidemiological study. Lancet. 2020;396:535-544.