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## **Asymptomatic SARS-CoV-2 infections in pregnant patients in an Italian city during complete lockdown**

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**Running title:** asymptomatic COVID19 in pregnancy

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**Abstract**

Data from both New York and London report a high prevalence of the asymptomatic SARS-CoV-2 infection in pregnant patients admitted for delivery, raising questions on the possible correlated dangers (i.e. contacts with healthcare workers; the possible creation of an intra-hospital outbreak at birth; conflicting evidences on vertical transmission). For this study, results from SARS-CoV-2 screening via nasopharyngeal swab from maternity wards of the four hospitals of Genoa, Italy were collected during a month of complete lockdown, from April 1 to April 30, 2020. Out of 333 tested women, only nine were symptomatic. Only one symptomatic patient (0.3%) and six asymptomatic ones (1.8%) tested positive. Out of the six positive asymptomatic patients, five were from the most disadvantaged neighbourhood of the city (assessed by postal code). In conclusion, even if Italy was badly affected by COVID19 in the studied month, the reported prevalence of SARS-CoV-2 infections in asymptomatic pregnant patients at term was lower than the ones reported in literature.

**Keywords:**

SARS-Cov-2; COVID19 and pregnancy, maternal leave policies; asymptomatic COVID19

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Introduction

Early detection and isolation of asymptomatic SARS-CoV-2 positive patients is a crucial public safety action [1], but a screening of the entire population is difficult to be

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organized and limited by test shortage. However, experiences of universal screenings in selected population were reported, among them pregnant patients admitted for delivery. The incidence of positive SARS-CoV-2 nasopharyngeal swabs in asymptomatic pregnant women were 13.5 and 6.2% in two reported screened cohort in New York and London [2, 3].

Genoa is an Italian metropolitan city with 852.009 inhabitants, situated in Liguria, directly neighboring Lombardy, the most affected Italian region. The first COVID19 case in Genoa was reported on March 1, 2020. Italy imposed complete lockdown to the entire population since mid-March. The first COVID19 case in a symptomatic pregnant patient was diagnosed on March 13, 2020, followed by other 10 symptomatic cases in pregnancy during the same month. As a consequence, since April 1, 2020 a universal screening with RT-PCR on nasopharyngeal swabs was implemented in all maternity wards of the city hospitals (San Martino Hospital, G. Gaslini Hospital, Galliera Hospital, Villa Scassi – ASL3 Hospital).

#### Materials and methods

Results from SARS-CoV-2 screening in all maternity wards were collected for this study from April 1, 2020 to April 30, 2020. Since the implementation of the universal screening, all pregnant women admitted for delivery were tested for SARS-CoV-2. Women were initially triaged based on symptoms (fever and/or cough or other respiratory symptoms), contacts with positive patients and travel history. They were asked also for their demographic data, current working situation and observance of lockdown measures. All patients included signed a written informed consent for the use of their anonymized data for clinical research. All nasopharyngeal swabs, collected by a nurse or a midwife, were then centralized in two laboratories. Total RNA was extracted from the swabs using QIAamp viral RNA kit (Qiagen) according to the manufacturer's procedure, the RNA was retrotranscribed and amplified using SuperScript III Platinum One-Step qRT-PCR Kit and a specific assay using a Mastercycler RealPlex2S system (Eppendorf, Hamburg, Germany). The screening was performed at two levels, the first level examined the presence of gene E (Envelope) using the following primers: 313241, 313242, 313243 (TIB Molbiol s.r.l., Genoa); the second level examined the presence of gene RdRp (RNA Polymerasi RNA dependent) using the following primers:

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313244,313246, 313250 (TIB Molbiol s.r.l., Genoa). As internal control, RNaseP was used (313252, 313253, 313254, TIB Molbiol s.r.l., Genova) to examine the presence of human RNA. Positive control (as defined by ISS) and negative control (water as template) were run simultaneously. The threshold was put beyond the noise of negative control. Tests were considered positive within 40 cq. The samples were labelled as 'indefinite' if the internal control RNaseP was not amplified or if the qPCR curve for gene E and/or RdRp was irregular.

The results are reported descriptively. Categorical data are expressed as number and frequency and continuous data as mean with standard deviation. Frequencies are compared through chi-square test. A p-value <0.05 is considered statistically significant.

## Results

From April 1, 2020 to April 30, 2020, 333 pregnant women (mean age 35.02+6.02 years) underwent the universal screening for SARS-CoV-2 infection. 261 (78.4%) of them were at term, 61 (18.3%) were tested at admission for late premature delivery (34-36 weeks gestation), the remaining 11 (3.3%) between 30 and 34 weeks of gestation. All patients reported to have stopped working and to have observed a complete lockdown. 325 of all the screened patients were completely asymptomatic. Nine patients were febrile, but only one (0.3%) resulted positive to SARS-CoV-2 infection. The other eight had two negative nasopharyngeal swabs and accordingly negative serology and were therefore treated as not infected. Out of the other 325 asymptomatic patients, 6 (1.8%) resulted positive, 2 had an indefinite result and the others were negative. The two swabs without a definitive answer were repeated, together with SARS-CoV-2 serology, and found all negative. Out of the six asymptomatic positive women, no one developed clinical symptoms and no infection was reported in the newborns. On note, 5 of the positive asymptomatic 6 patients were from the most disadvantaged neighborhood of the city (assessed by postal code) and 4 out of 6 were migrants (2 from Ecuador, 1 from Nigeria and 1 from Bangladesh), although all living in Genoa at least since the beginning of the pregnancy. Out of the asymptomatic negative patients, instead, only 70 out of 319 lived in the most disadvantaged areas (21.9% vs. 83.3%,  $p < 0.001$ ) and 103 had not Italian citizenship (32.3% vs. 66.7%,  $P = 0.07$ ).

## Discussion

COVID-19 transmission through asymptomatic carriers was described in literature during the early months of the pandemic [4, 5] and immediately raised great concern for the difficulties in identifying and isolating asymptomatic positive carriers. The experiences of universal screenings of pregnant people admitted to the hospital for delivery have great relevance for more than one reason. First of all, even if vertical transmission from an asymptomatic carrier was never described [6,7], these infections are still particularly dangerous, because of the numerous contacts with healthcare workers and the possible creation of an intra-hospital outbreak at birth. Awareness of the entity of the phenomenon is therefore an essential public health measure. Moreover, while pregnant women could never be entirely representative of the general population, especially because of the hypothesized protective role of estrogens [8], they are a subgroup in which such analysis is more feasible than in the entire population.

Our percentage of asymptomatic infected pregnant patients is considerably lower than previously reported, despite being in a region with high prevalence of the disease (+3508 new cases in April in Genoa) [9]. In our opinion it could be the direct effect of the lockdown measures, which were implemented in all Italy by national law more than two weeks before the start of our universal screening. Indeed, lockdown and social distancing have been proved to be among the most efficacious measure for infection containment [10].

The existence of paid antenatal maternity leave for the vast majority of Italian population may have played a role too, but it is not possible to infer direct causation from this data. However, it is interesting to underline how none of the screened pregnant patients reported to have continued to work near term during COVID19 pandemic and they observed an almost complete lockdown. On note, the few cases reported were among the most disadvantaged population, in neighborhoods where it is more likely to live in smaller houses, with a higher number of cohabitants.

Our results represent a snapshot of a month in a severely hit area and underline once again the relevance of public health measures like social distancing, mask wearing and ultimately lockdown in the containment of the pandemic, reporting small numbers of

symptomatic and asymptomatic positive pregnant patients in an Italian metropolitan city after the implementation of these measures.

### **Conflict of interest**

All Authors report no conflict to interest to declare

### **Authors' contribution statement**

A.F. and P.A. had the research idea and designed the study. C.M. analysed the data and wrote the manuscript. R.P. and M.D.L. collected patients' data. M.A., A.C., F.G., C.G. and G.V. were responsible for the universal screening in the included hospitals. All Authors commented on previous versions of the manuscript, contributed to clinical discussion and read and approved the final submitted version.

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