

MOTHERS' ANXIETY TO AGGRAVATED ACUTE FEAR OF EARTHQUAKES IN THE CITY OF ZAGREB IN THE COVID-19 PANDEMIC

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SUMMARY

Background: Here we present the results of a psychometric investigation on current fear of COVID-19 infection aggravated by the earthquake-induced stress in the group of puerperal women.

Subject and methods: A group of 16 hospitalized puerperal women that gave birth at Clinical Hospital Sveti Duh in Zagreb, Department of Obstetrics and Gynecology were enrolled in retrospective clinical investigation. All the patients delivered during COVID-19 pandemic and experienced devastating earthquake on March 22nd. The women were interviewed on the exact day of the earthquake, 4 hours after the main hit and 6 months after that during second pandemic wave on October of the same year. Women were also questioned about the breastfeeding. The participants provided written informed consent and were interviewed using Generalized Anxiety Disorder 7-item (GAD-7) scale for evaluation of generalized anxiety disorder.

Results: Minimal level of anxiety after the earthquake was shown for 10 mothers with 6 of them having the highest level 4. Mild anxiety was proven for 3 patients, 2 exhibited moderate anxiety with one puerperal women with severe anxiety. One could say that 37.5% of enrolled patients exhibited some degree of anxiety after the earthquake (scoring >5). At second time point during COVID-19 pandemic 13 participants had minimal anxiety score, 2 had mild, while 1 participant had moderate score evaluated by GAD-7 scale (18.8%). At the time of the earthquake 13 participants were breastfeeding (81.3%), while 3 were not due to the personal reasons. 6 months after the earthquake only 7 mothers were breastfeeding (43.8%), while 9 of the participants were feeding their children with adapted milk (56%). Main reason for breastfeeding discontinuation was the stop of milk secretion in the 6 months period after the delivery.

Conclusions: To our knowledge, our study is the only national study dealing with mental health problems in a population of puerperal and breastfeeding mothers in a challenging time of COVID-19 pandemic aggravated by devastating earthquake.

Key words: COVID-19 – pandemic – earthquake - maternal mental health – anxiety - breastfeeding

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INTRODUCTION

It is well known that biohumoral events and other endogenous processes during pregnancy, labour and puerperium have impact on maternal perinatal psychosocial condition. Substantial degree of maternal fear for pregnancy outcome is usually well tolerated if it is not accompanied by severe anxiety and panic attacks that are seen more often in high risk pregnancies and preterm deliveries. Reactive psychotic episode occur in around 10 to 20% of pregnant and puerperal women depending upon previous mental status, previous psychological disorders, social conditions, marital status, comorbidity and different medication usage. It is obvious that psychological status and responses during several months of pregnancy are different from those from early and late puerperium when relatively rapid event of labour affect different biohumoral events that modulate psychological processes (Ceulemans et al. 2020, Habek 2017, Prill 1982, Staneva et al. 2015). Nowadays during the current COVID-19 pandemic, there are several studies published on pregnant patients reactions caused by exogenous stressogenic events called pandemic-related pregnancy stress (Molgora & Accordini 2020, Preis et

al. 2020, Saccone et al. 2020). This stress was induced by the fear of unknown new disease, its unknown course and outcome, possible vertical transmission from an infected mother to the fetus, complications during labour and significant life-style modulation due to the lockdown adaptation.

The first cases of coronavirus disease 2019 (COVID-19) caused by Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) were discovered from middle of March 2020 in Croatia. Additionally the capital of Croatia, Zagreb was hit by the devastating earthquake on March 22nd with extensive widespread material damage. This event forced most of the population on to the streets after social distancing regulations to prevent the spread of coronavirus had been put in place. It is expected that both stressful occurrences might have high impact on collective and individual mental health leading to the necessity of its investigation and follow-up, especially in the vulnerable group of pregnant and puerperal women.

Here we present the results of a psychometric investigation on current fear of COVID-19 infection aggravated by the earthquake-induced stress in the group of puerperal women.

Table 1. Level of anxiety on the day of earthquake in actual COVID-19 pandemic and after six months later - GAD-7 scale (n=16)

Level of anxiety	Scor	March 22, 2020 - n (%)	Six monts after - n (%)
Minimal	0-4	10 (62.5)	13 (81.3)
Mild	5-9	3 (18.8)	2 (12.5)
Moderate	10-14	2 (12.5)	1 (6.2)
Severe	15-21	1 (6.2)	0
Breastfeeding	Yes	13 (81.3)	7 (43.8)
	No	3 (18.8)	9 (56.3)

SUBJECT AND METHODS

A group of 16 hospitalized puerperal women that gave birth at Clinical Hospital Sveti Duh in Zagreb, Department of Obstetrics and Gynecology were enrolled in retrospective clinical investigation. The investigation was approved by Ethics Committee of Clinical Hospital Sveti Duh Zagreb. The participants provided written informed consent and were interviewed using Generalized Anxiety Disorder 7-item (GAD-7) scale for evaluation of generalized anxiety disorder with sensitivity of 89% and specificity of 82% (Spitzer et al. 2006). The women were interviewed on the exact day of the earthquake, 4 hours after the main hit and 6 months after that during second pandemic wave on October of the same year. Women were also questioned about the breastfeeding.

All the patients delivered during COVID-19 pandemic and experienced devastating earthquake on March 22nd at 6.24 am as hospitalized patients. At that time 21 puerperal patients who delivered the previous day or two were accommodated in rooming-in conditions, while 4 patients were at hospital stay due to the premature infants hospitalized at NICU. Five patients did not want to participate in the investigation. All the included patients did not have any previous psychiatric disorders, they all delivered vaginally and were old between 24 and 35 years. The group of interviewed women included 9 primiparas, 5 secundiparas and 2 terciaras. The patients were not tested for SARS-CoV-2S since this was not a routine procedure at that time and no patients had any disease symptoms. After the first earthquake hit of 5.5 on the Richter scale with an epicenter 7 kilometers north of the city centre and the maximum felt intensity of VII (very strong) on the Modified Mercalli intensity scale, 9 puerperal women left the hospital building with their children, while 12 of them stayed and continued breastfeeding. Hospital personnel were helping the mothers, especially with the blankets since it started snowing. Since the earthquake was followed by several aftershocks, 5 of patients who stayed in front of hospital refused to return to the building and left the hospital area with family members who arrived in mean time.

RESULTS

The main investigation results are given in Table 1. Minimal level of anxiety after the earthquake was shown for 10 mothers with 6 of them having the highest

level 4. Mild anxiety was proven for 3 patients, 2 exhibited moderate anxiety with one puerperal women with severe anxiety. One could say that 37.5% of enrolled patients exhibited some degree of anxiety after the earthquake (scoring >5). 3 patients were taking benzodiazepines of 2 g occasionally when were feeling anxious or restless during following 3 months. At second time point during COVID-19 pandemic 13 participants had minimal anxiety score, 2 had mild, while 1 participant had moderate score evaluated by Generalized Anxiety Disorder 7-item (GAD-7) scale (18.8%). At the time of the earthquake 13 participants were breastfeeding (81.3%), while 3 were not due to the personal reasons. 6 months after the earthquake only 7 mothers were breastfeeding (43.8%), while 9 of the participants were feeding their children with adapted milk (56%). Main reason for breastfeeding discontinuation was the stop of milk secretion in the 6 months period after the delivery. Although collective panic reaction was assumed after the devastating earthquake, hospital personnel gave their effort in encouraging the mothers in breastfeeding continuation. Mothers who left the hospital soon after the earthquake were in contact with hospital doctors and midwives and later with primary care physicians and health visitors. This professional support was of great importance for anxiety management and breastfeeding continuance, as well.

DISCUSSION

Physiological mental puerperal state include and so called *postpartum blues* which is a transient condition after childbirth, which commonly include mood swings, crying spells, anxiety and difficulty sleeping. *Postpartum blues* is considered as psychological reaction to delivery and newborn that can be found in approximately 50% of puerperal women. Exogenous stressors such as acute event like earthquake could aggravate chronic stress which is widespread in COVID-19 pandemic and impact psycho emotional state of mothers in vulnerable period of early puerperium. This can result in higher levels of anxiety and panics. There are several published studies recently showing that cesarean section increases the postpartum depression occurrence (Moameri et al. 2019, Staneva et al. 2015, Šporčić et al. 2021) which could be the problem for countries that allowed the cesarean section on patient demand. Moreover, it has been shown that elective cesarean section as unnatural

anthropological event became iatrogenic exogenous stressogenic factor for many women (Habek 2020). It is interesting that novel perinatal psychometric test used in the current COVID-19 pandemic do not consider maternal fear of labour pains (tokophobia) but are rather focused on pregnancy outcome, underestimating the mode of delivery (Molgora & Accordini 2020, Thapa et al. 2020). Our recent publications on stress - related perinatal outcomes, including long-term outcome of offspring born during war aggression in Vukovar in year 1999 have shown increased breastfeeding disorders, cognitive and attention disorders and impaired stress reactions in those children (6.5%). The children were followed-up for 23 years and no other developmental anomalies or comorbidity were found as compared to the general population (Habek et al. 2016a,b).

There are several new published psychometric tests for perinatal stress related to COVID-19 infection evaluation validated in a large number of pregnant patients. Preis and coworkers have classified two types of pandemic-related pregnancy stress: stress associated with feeling of unpreparedness for birth due to the pandemic (Preparedness Stress) and second stress related to fear of perinatal COVID-19 infection (Perinatal Infection Stress) (Preis et al. 2020a,b). This group created Pandemic-Related Pregnancy Scale (PREPS) as psychometric objectivization of pregnant patients reaction on stress. On the other hand, Schaal and his group have published german PREPS version evaluated on a group of 1364 patients with defined sociodemographic, obstetric and different psychological factors (Schaal et al. 2020). They have confirmed the value of their scale modification as a auxiliary method in psychometry of perinatal exogenous stress with a need of further scientometric evaluation of the scale (Schaal et al. 2020). Stressogenic factors for pregnant women during COVID-19 pandemic could be: fear of neonatal infection, inability of adequate prenatal and postnatal care, general insecurity, long-term quarantine, social isolation, existential conditions in a time of general lockdown, possibility of limited parenthood, fear of unknown virus and its impact on general health and economy (Molgora & Accordini 2020, Thapa et al. 2020).

The preexisting and already established GAD 7 scale has been used in our study due to the lack of specific scales for anxiety evaluation during period of breastfeeding and puerperium in COVID-19 pandemic (Spitzer et al. 2006). There are several psychometric published studies that have confirmed emotional instability and mental health deteriorations such as depression and anxiety in pregnant and puerperal women according to the GAD 7 scale of Belgian authors (Brown et al. 2020, Ceulemans et al. 2020, Lopez-Moralez et al. 2020). Ceulemans and his group have investigated the group of 2412 pregnant and 3445 puerperal women and have shown that 25.2% of pregnant women had depressive syndrome as compared to 23.6% of puerperal women, while 40% of all women had anxiety with score of 5 and over according to the GAD-7 scale, while 14% of them

had score of 10 and over (Ceulemans et al. 2020). Although our number of evaluated patients is relatively low since our study included only pregnant and puerperal women during actual earthquake and pandemic, the results are significant and indicative. In our study 37.5% of evaluated patients had score of 5 and over according to the GAD-7 scale in acute phase as compared to 18.8% of women in time point of 6 months after. These results are in accordance with previously mentioned studies on a larger number of women (Nakic Rados et al. 2018). Breastfeeding was discontinued in 56% of puerperal women in a period of 6 months which represents significant decrease since it has been shown that around 72% of infants in Croatia are breastfed in first sixth months (Milos et al. 2019).

CONCLUSION

The results from our study have confirmed that COVID-19 pandemic combined by strong earthquake represent significant, synergistic and multidimensional exogenous stressogenic factors especially in a vulnerable population group such as new mothers. Several previously mentioned authors have confirmed that mental health worldwide has been disturbed by COVID-19 pandemic leading to the conclusion of the necessity of continuous short and long-term professional care in preventing acute mental disturbances and post-traumatic stress disorders. To our knowledge, our study is the only national study dealing with mental health problems in a population of puerperal and breastfeeding mothers in a challenging time of COVID-19 pandemic aggravated by devastating earthquake.

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Contribution of individual authors:

Ana Tikvica Luetić, Dubravko Habek, & Ivan Šklebar: study design, first draft, statistical analysis.

Petar Špoljar & Ivan Antonio Miletić: data collection.

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