

## Hubungan kadar zinc serum maternal terhadap sitokin pro-inflamasi pada wanita hamil yang terkonfirmasi COVID-19 = The relation between maternal serum zinc level and pro-inflammatory cytokines level in pregnant women with confirmed COVID-19

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### Abstrak

Latar Belakang : Wabah pneumonia akibat Corona Disesase 2019 (COVID-19) masih menjadi perhatian nasional maupun global. Wanita hamil termasuk dalam kelompok risiko tinggi/rentan terhadap infeksi COVID-19. Adanya badai sitokin akibat infeksi COVID-19 menyebabkan gejala klinis yang semakin berat. Zinc sebagai salah satu mikronutrien penting yang berpengaruh dalam regulasi produksi sitokin oleh sistem imun tubuh. Kondisi defisiensi zinc pada wanita hamil yang terinfeksi COVID-19 dapat menyebabkan disregulasi dari sistem imun dan menghasilkan badai sitokin yang mengakibatkan sindrom ancaman gagal napas akut dan kematian. Tujuan : Meneliti hubungan kadar zinc serum maternal terhadap kadar sitokin pro-inflamasi interleukin-6 (IL-6) dan interferon gamma (IFN-) pada wanita hamil yang terkonfirmasi COVID-19 dengan gejala ringan-sedang dan berat. Metode : Penelitian observasional dengan desain studi cross-sectional. Subyek penelitian adalah wanita hamil yang terkonfirmasi COVID-19 dengan gejala ringan-sedang dan berat. Faktor yang diteliti meliputi kadar zinc, IL-6 dan IFN- serum maternal dan hubungannya kadar zinc serum terhadap kadar IL-6 dan IFN- serum maternal.

Hasil : Jumlah total subyek sebanyak 48 orang dibagi menjadi 28 subyek untuk kelompok wanita hamil yang terkonfirmasi COVID-19 gejala ringan-sedang dan 20 subyek dengan gejala berat. Rata-rata usia responden 30,61 tahun untuk kelompok gejala ringan-sedang dan 32,9 tahun untuk kelompok gejala berat. Rata-rata usia kehamilan pada kelompok gejala ringan-sedang lebih tua dibanding kelompok gejala berat (38,1 minggu vs 34,5 minggu). Lama perawatan kelompok dengan gejala berat lebih lama dibanding kelompok gejala ringan-sedang. 60% subyek dari kelompok gejala berat berakhir dengan kematian maternal. Semua subyek dalam penelitian ini mengalami defisiensi zinc. Tidak terdapat perbedaan bermakna kadar zinc serum maternal pada kedua kelompok yaitu 54,0 (34-78) g/dl untuk kelompok gejala ringan-sedang dan 52,0 (38-97) g/dl untuk kelompok gejala berat. Terdapat perbedaan bermakna antara kelompok gejala ringan-sedang dengan kelompok gejala berat terhadap kadar IL-6 serum (5,8 (1,5-69,6) pg/ml vs 18,6 (3,8-85,3) pg/ml) dan kadar IFN- serum (0,9 (0,1-16,8) pg/ml vs 9,0 (0,9-21,1) pg/ml). Tidak ada korelasi antara kadar zinc serum maternal dengan kadar IL-6 dan IFN- serum maternal. Kesimpulan : Kadar zinc serum maternal tidak berbeda bermakna diantara kedua kelompok penelitian. Kadar IL-6 dan IFN- serum kelompok gejala berat lebih tinggi dibanding kelompok gejala ringan-sedang. Tidak ada korelasi antara kadar zinc serum dengan kadar IL-6 dan IFN- serum maternal.

.....Background : The outbreak of Corona Disesase 2019 (COVID-19) is still a national and global concern. Pregnant women are included in the highrisk/susceptibility group for COVID-19 infection. The presence of a cytokine storm due to COVID-19 infection causes increasingly severe clinical symptoms. Zinc is one of the important micronutrients that influence the regulation of cytokine production by the immune system. Zinc deficiency in pregnant women with confirmed COVID-19 can cause dysregulation of the immune system and produce a cytokine storm that results in acute respiratory distress syndrome and maternal death.

**Objective:** To evaluate the relationship between maternal serum zinc levels and the pro-inflammatory cytokines interleukin-6 (IL-6) and interferon-gamma (IFN-) in pregnant women with confirmed COVID-19 with mild-moderate and severe symptoms. **Methods:** A cross-sectional was adopted in this study. The subjects of the study were pregnant women with confirmed COVID-19 with mild-moderate and severe symptoms. We measure the maternal serum zinc levels, serum IL-6 and IFN- levels, then we evaluate the relation between the maternal serum zinc levels and the maternal serum IL- 6 and IFN- levels.

**Results:** The total number of subjects was 48 patients, divided into 28 subjects for the pregnant women with confirmed COVID-19 with mild-moderate symptoms and 20 subjects with severe symptoms. The average age of the respondents was 30.61 years for the mild-moderate group and 32.9 years for the severe group. The mean gestational age in the mild-moderate group was older than in the severe one (38.1 weeks vs. 34.5 weeks). The length of stay of subjects with severe symptom was longer than the mild-moderate group. 60% cases from the severe group ended in maternal death. All the participants in this study suffered zinc deficiency. There was no significant difference in maternal serum zinc levels between the two study groups (54.0 (34-78) g/dl in mild-moderate group vs 52.0 (38-97) g/dl in severe group). There was a significant difference between mild- moderate vs severe groups in which the serum IL-6 levels were (5.8 (1.5-69.6) pg/ml vs 18.6 (3.8-85.3) pg/ ml) and the serum IFN- levels were (0.9 (0.1-16.8) pg/ml vs. 9.0 (0.9- 21.1) pg/ml). There is no correlation between maternal serum zinc level and maternal serum IL-6 and IFN- levels.

**Conclusion:** The maternal serum zinc levels were not significantly different between the two study groups. The maternal serum IL-6 and IFN- levels in the severe group were higher than in the mild-moderate group. There is no correlation between maternal serum zinc level and maternal serum IL-6 and IFN- levels.