

# Interaction and influence of parity and gestational age on the lung volume and lung density by computed tomography images during normal pregnancy

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## Abstract

**Objectives:** The aim of this study was to demonstrate the interaction and influence of gestational age and parity on the lung volume and lung density through Computed Tomography (CT) imaging data among healthy pregnant women. **Design:** Retrospective cross-sectional study **Setting:** Two clinical sites in Wuhan Hubei Province. **Sample:** pregnant women and non-pregnant women. **Methods:** Linear mixed-effects regression model and generalized additive mixed model (GAMM) were taken to control the potential confounders and evaluate the interact effects of lung volume and lung density. Univariate analysis estimated the influence of gestational age and parity on the lung volume and lung density. **Main Outcome Measures:** Lung volume (left, right, total), lung density (left, right, total). **Results:** The total lung density of all patients in GAMM was significantly increased with gestational age ( $p < 0.001$ ). Univariate analysis showed that the absolute value of total lung volume decreases with the progression of gestation ( $p = 0.040$ ), this tendency is also displayed in both the left lung and right volume. Lung volume of multipara in the third trimester was lower than the first trimester, and it had significant difference between T1 and T3 ( $p = 0.0196$ ). Furthermore, this study found that the lung volume of multiparous women was lower than primiparous in the third trimester ( $p = 0.009$ ). Nevertheless, the lung density increased with gestational age in primiparous, particularly in the third trimester ( $p = 0.007$ ), the lung density of multipara was lower than nullipara ( $p < 0.001$ ), more delivery times follow lower lung density, and there was a significant difference when compared with each parity state. During the third trimester, the lung density of multiparous declined when compared with primiparous ( $p < 0.001$ ). **Conclusion:** Parity and gestation age tended to have an impact on the alterations of lung volume and lung density in physiological pregnant women. Lung density of multipara was lower than nullipara, more delivery times follow lower lung density, indicating parity was associated with lung density.

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