

Effect of Maternal Exposure to PM_{2.5} on Proinflammatory Cytokine, Oxidative Stress Marker and Serotonin in Umbilical Cord Blood

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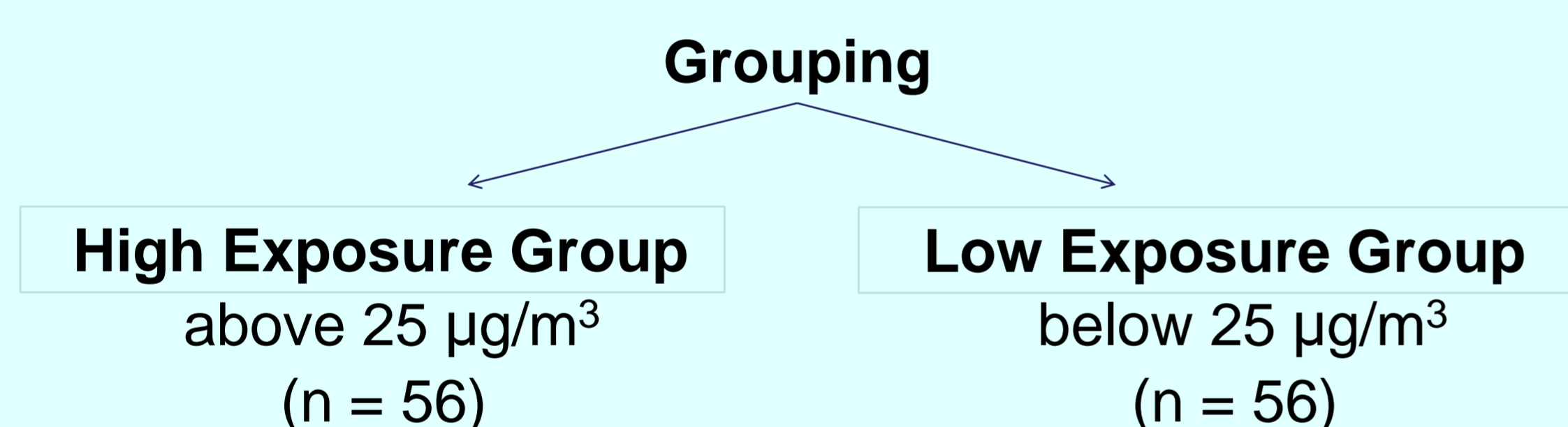
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Introduction

- Air pollution is a global health concern which is possible to impose health hazard at any age.
- Intrauterine growth period is more vulnerable for the developing fetus, and recently, possible transplacental transfer of fine particulate matter has been reported ⁽¹⁾.
- This study aimed to investigate the effect of PM_{2.5} exposure during third trimester of pregnancy on the cord blood level of cytokine interleukin (IL) 1 β , oxidative stress marker (heme oxygenase-1) and acute stress marker serotonin by comparison between high PM_{2.5} exposed mothers (high exposed group; PM_{2.5}>25 $\mu\text{g}/\text{m}^3$) and low PM_{2.5} exposed mothers (low exposed group; PM_{2.5}<25 $\mu\text{g}/\text{m}^3$) ⁽²⁾.

Materials and Method

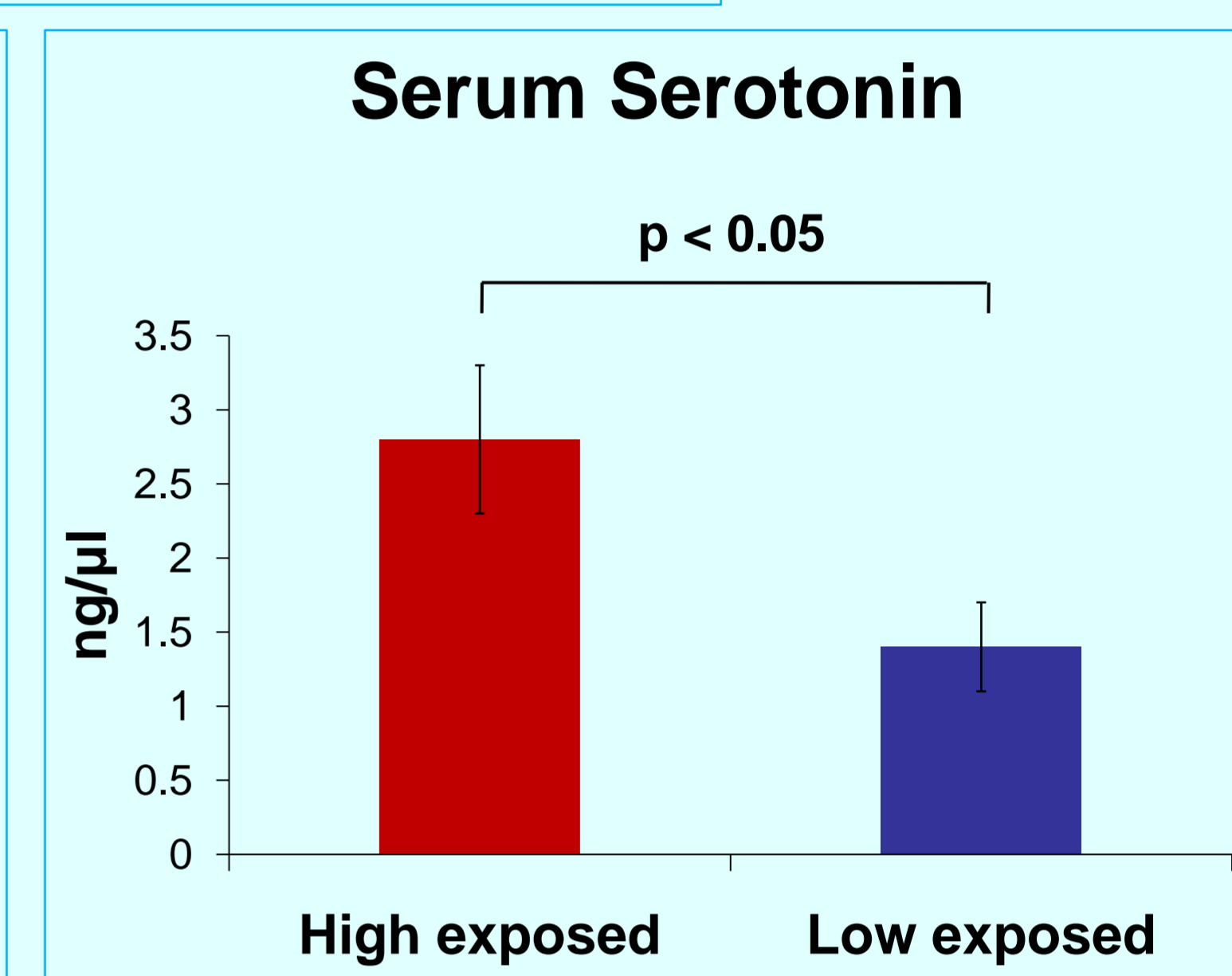
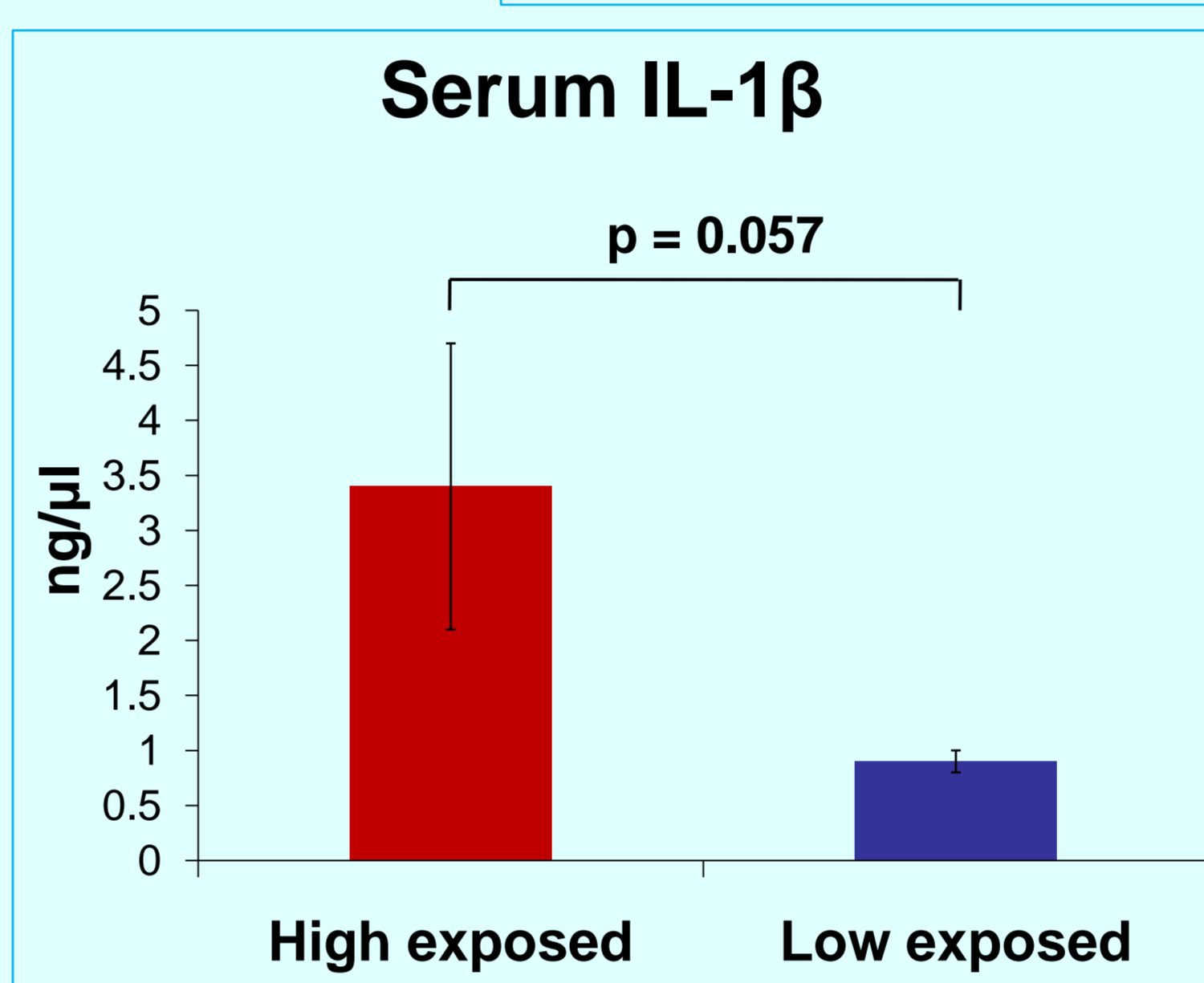
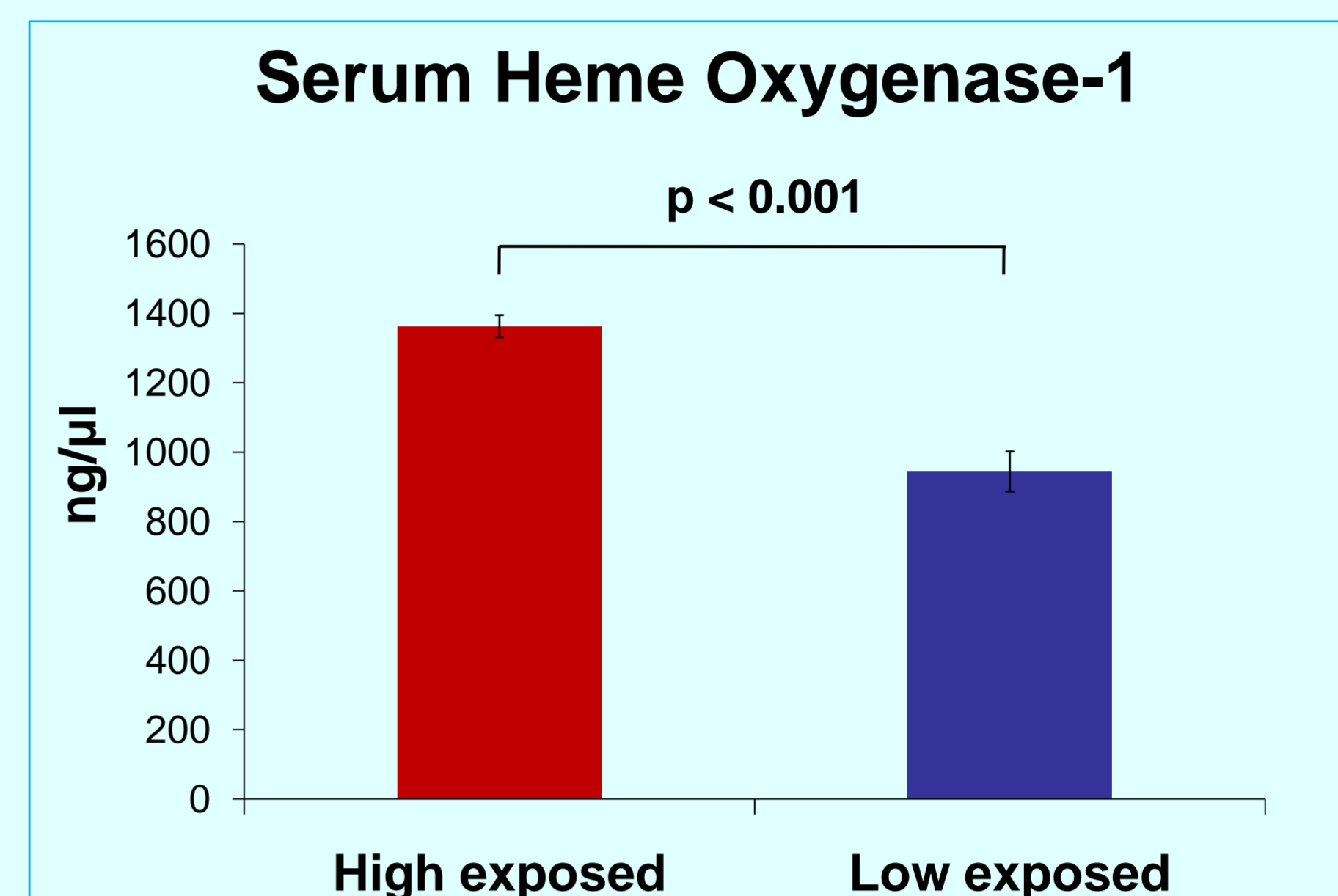
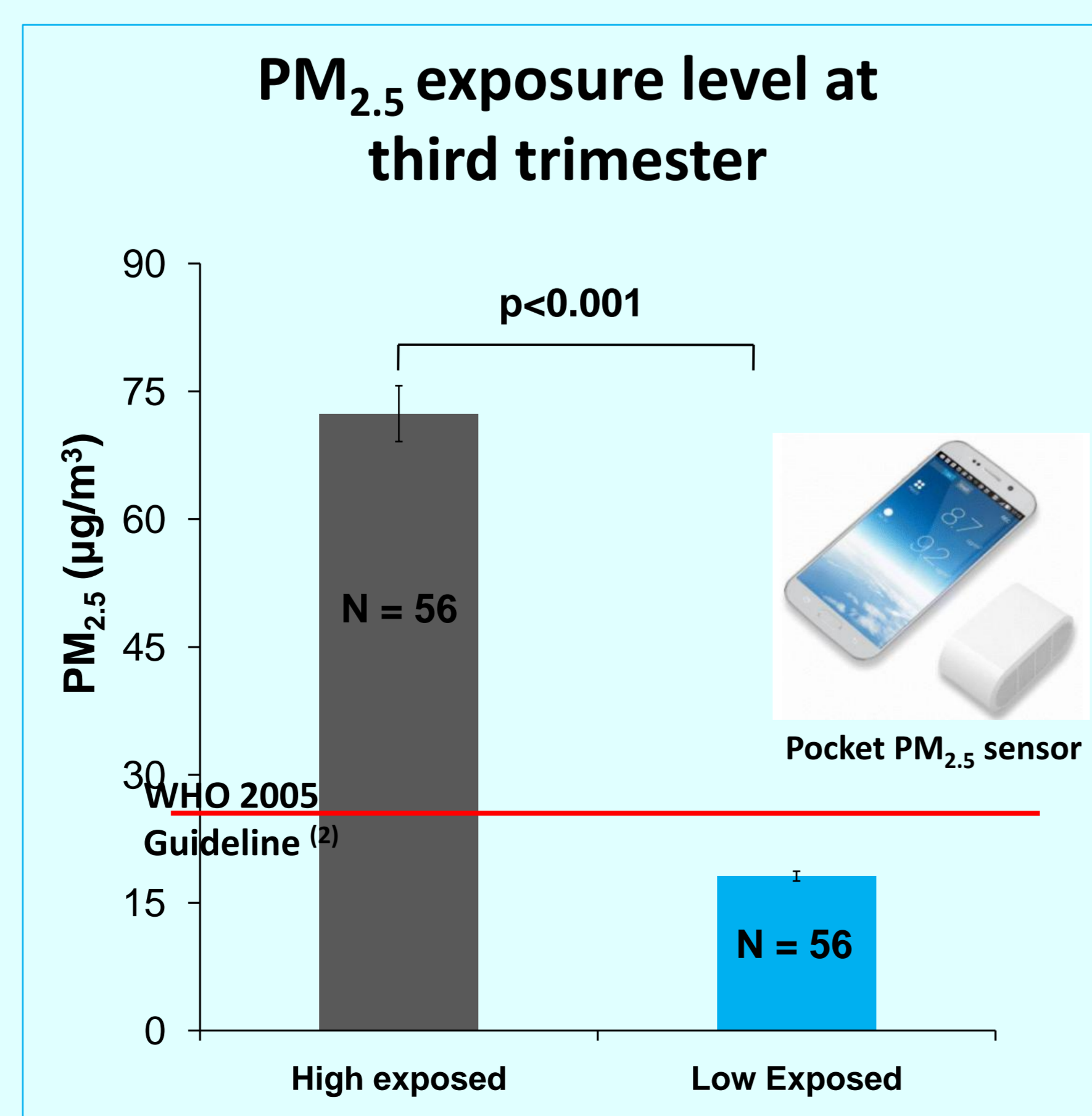
- (Pilot Study) Localization of high and low PM_{2.5} Exposure areas in Yangon and Taunggyi Cities.
- Recruitment of pregnant women at AN care of CWH, Yangon and WCH, Taunggyi who resided at pilot-study-determined locations of these two Cities.



- Confirmation of PM exposure level by PM measurement at their homes.
- Cord blood collection from normal spontaneous vaginal delivery (n=56 each group) and serum analysis of IL-1 β , heme oxygenase-1 and serotonin.

Results

Data were presented as mean (SEM).



	High exposed	Low exposed
PM _{2.5} Exposure Level ($\mu\text{g}/\text{m}^3$)	72.38 (3.28)***	18.11 (0.57)
Maternal Age (yrs)	26.7 (19 - 42)	26.7 (18 - 47)
Birth Weight (Kg)	3.06 (0.06)	3.06 (0.04)
MBD (wk)	38.8 (0.3)	39.3 (0.3)
HO-1 (ng/μl)	1363.2 (32)***	944.3 (58)
IL-1 β (ng/μl)	3.4 (1.3)	0.9 (0.1)
Serotonin (ng/μl)	2.8 (0.5)*	1.4 (0.3)

Discussion & Conclusion

- Mean cord blood serum levels of IL1 β , heme oxygenase-1 and serotonin of exposed group were significantly higher than those of control group even when birth weight and gestation were comparable between groups.
- These results suggest that maternal inhalation of PM during third trimester may induce systemic inflammation and oxidative stress in fetus, accompanied with change in cord blood of IL1 β , heme oxygenase-1 and serotonin level.

Acknowledgement

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References

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