Physiologic and Subjective Responses to Wearing N95 Filtering Facepiece Respirators in Advanced Pregnancy

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Background:

Approximately10% of the U.S. female workforce of reproductive age (15 - 44 yrs) will be pregnant at any given time, and a considerable number of these women will be employed in occupations that require the use of respiratory protective equipment, yet little scientific data exist on the physiological and subjective impact of this equipment during pregnancy.

Methods:

Twenty-two healthy pregnant (13 – 35 weeks gestation) and non-pregnant women, experienced in the use of respiratory protective equipment, were monitored physiologically (heart rate, respiratory rate, transcutaneous carbon dioxide, oxygen saturation, temperature, fetal heart rate) and subjectively (exertion, thermal comfort) during one hour of combined postural sedentary activity (standing, sitting) and moderate exercise (bicycle ergometer) with and without wearing a fit tested N95 filtering facepiece respirator (N95 FFR). Seventeen of the same pregnant and non-pregnant subjects were also monitored for additional cardiovascular parameters (blood pressure, mean arterial pressure, total peripheral resistance, stroke volume, cardiac output) during the study sessions.

Results:

N95 FFR use by pregnant women, compared with demographically similar non-pregnant women, was not associated with significantly different ($p<0.05$) mean values for any of the measured physiologic or subjective parameters.

Conclusions:

The use of N95 FFR, for one hour of combined sedentary and exercise activities by women in the second and third trimesters of pregnancy, did not result in any significant difference in measured cardiac, vascular, pulmonary or subjective variables compared with non-pregnant women. Further studies are needed to determine the impact of N95 FFR use in pregnancy over extended periods of wear.