

Inflammatory status and vascular function in veterans of burn pit exposure

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Veterans of the Southwestern Asia theater of war were variably exposed to smoke from burn pits. Despite measurements of the air quality at that time which suggested there was not significant danger to personnel, within the past five years there has been a significant increase in veterans reporting with shortness of breath despite normal pulmonary function tests. The present study recruited veterans from this theater of war and who have self-reported with dyspnea. Along with a range of diagnostic tests subjects were assessed for brachial artery function by ultrasound following forearm occlusion. Blood samples were taken before and after occlusion and vascular nitrite and nitrate were measured using reductive chemiluminescence. In addition, a sample was used to profile activation in monocytes, granulocytes, and lymphocytes expression following magnetic separation. Within monocytes activated cells were identified by their expression of both CD11b and CD87. The appearance of these cells is correlated ($R^2=0.61$) with expression of a low level of CD16 and CD14; as well as expression of both HLADR and CD163 ($R^2=0.76$). There do not appear to be significant populations of activated granulocytes or lymphocytes within these subjects. The appearance of activated monocytes is correlated with impairment of vascular function that may contribute to the observed symptom of dyspnea. Therefore, we also measured nitrite and nitrate within the plasma of these subjects pre and post hyperemia. These results will be discussed in the context of possible changes that may have occurred in baseline inflammatory status and that may contribute to their symptoms.