

Serum Concentrations of Tumor Necrosis Factor- α and its Soluble Receptors in Soldiers with and Without Combat-related Posttraumatic Stress Disorder: Influence of Age and Body Mass Index

Hubertus Himmerich^{1,2,3}, Jörg-Egbert Wolf¹, Peter Zimmermann¹, Antje H Bühler¹, Lesca M Holdt⁴, Daniel Teupser⁴, Kenneth C Kirkby⁵, Gerd D Willmund¹, Ulrich Wesemann¹

¹Department of Psychiatry, Psychotherapy and Psychotraumatology, Bundeswehr Hospital, Berlin, Germany

²Department of Psychological Medicine, King's College London, London, UK

³Department of Psychiatry and Psychotherapy, University Hospital Leipzig, Leipzig, Germany

⁴Department of Laboratory Medicine, Ludwig-Maximilians-University, Munich, Germany

⁵Department of Psychiatry, University of Tasmania, Hobart, Tasmania, Australia

To the Editor: With great interest we read the original article of Chen *et al.*^[1] published in the Chinese Medical Journal comparing serum concentrations of cytokines in patients of Han and Li ethnicity with posttraumatic stress disorder (PTSD). The authors found significantly higher serum concentrations of the cytokines interleukin (IL)-2, IL-6, IL-8, and tumor necrosis factor (TNF)- α in PTSD patients compared to normal controls, and differences in cytokine concentrations according to ethnicity.

At the Bundeswehr (German Armed Forces) Hospital in Berlin, Germany, we recently performed a study including 135 male German soldiers of which seventy had been deployed abroad. In the subsample of soldiers deployed abroad, 38 suffered from combat-related PTSD according to the Tenth Revision of the International Classification of Diseases criteria after their deployment, whereas 32 soldiers did not. All seventy subjects were of German ethnicity. TNF- α and its soluble receptors TNF-R p55 and p75 were measured in the serum using an individually arranged Bio-Plex Pro™ human cytokine immunoassay from Bio-Rad, Germany.

To compare our study results with those of Chen *et al.*,^[1] we analyzed data of $N = 70$ soldiers deployed abroad. One-way analysis of variance revealed no statistically significant differences for TNF- α and TNF-R p75 levels between groups (with or without PTSD). Only TNF-R p55 serum concentrations differed significantly ($F [1, 66] = 10.76, P = 0.002$). For a boxplot of TNF-R p55 levels [Figure 1]. In a consecutive analysis of covariance controlling for age and body mass index (BMI), the difference in TNF-R p55 levels was no longer statistically significant ($F [1, 55] < 1$, nonsignificant). Age ($F [1, 55] = 5.23, P = 0.026$) and BMI ($F [1, 55] = 9.15, P = 0.004$) explained 23.4% of variance.

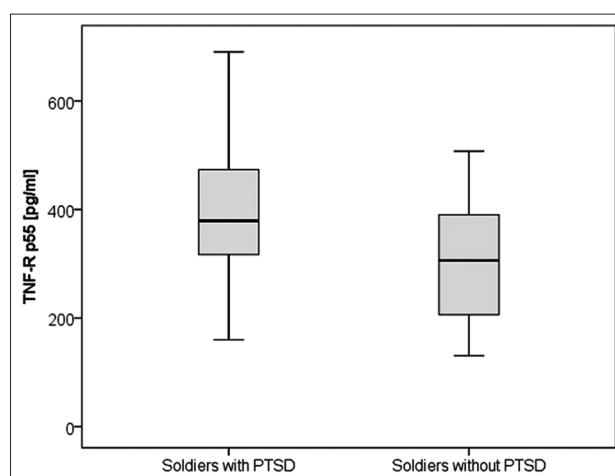


Figure 1: Boxplot of TNF-R p55 levels of soldiers with ($n = 38$) and without ($n = 32$) posttraumatic stress disorder. Although one-way analysis of variance revealed a significant difference of TNF-R p55 serum concentrations between both groups ($F [1, 66] = 10.76, P = 0.002$), analysis of covariance controlling for age, body mass index, and smoking did not replicate this finding. TNF-R: Tumor necrosis factor receptor; PTSD: Posttraumatic stress disorder.

Address for correspondence: Dr. Hubertus Himmerich, Department of Psychological Medicine, King's College London, London, UK
E-Mail: hubertus.himmerich@kcl.ac.uk

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Therefore, our results obtained from a sample of male German soldiers could not replicate the finding of Chen *et al.*^[1] of elevated TNF- α levels in Chinese civilian patients with PTSD. One has to keep in mind that the studies differ on race, ethnicity, sex, occupation, and geographical context of participants. However, there are comparable studies,^[2,3] which also report elevated TNF- α levels in PTSD patients similar to Chen *et al.*^[1]

Age and BMI seem to be important variables influencing TNF-R p55 levels.^[4] In our sample of German soldiers, this influence of age and BMI on TNF-R p55 levels was greater than the influence of PTSD. The dependence of TNF-R p55 levels, as well as TNF- α and TNF-R p75 levels on age and BMI, has been reported several times before, for example, in a general population sample.^[4]

In summary, considering the cited articles^[1,4] and our own study together, we conclude that ethnicity, age, and BMI appear to be important variables influencing the levels of TNF- α and its soluble receptors. Therefore, these parameters should be taken into account when investigating serum concentrations of TNF- α and its receptors in the studies of PTSD and other conditions.

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Conflicts of interest

There are no conflicts of interest.

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