Prognosis value of the blood transaminase in acute ischaemic stroke: gender factors should be considered

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With respect to the paper published recently in Clinical Science by Campos et al. [1] on blood levels of glutamate oxaloacetate transaminase being more strongly associated with good outcome in acute ischaemic stroke than glutamate pyruvate transaminase levels, we would like to raise a cautionary note.

It has been well established that abnormally high concentrations of L-glutamate (glutamate) in the interstitial fluid and CSF (cerebrospinal fluid) of the brain are associated with several neurodegenerative conditions. Increased glutamate concentrations after acute ischaemic stroke are correlated with a poor neurological outcome. GOT (glutamate-oxaloacetate transaminase) and GPT (glutamate-pyruvate transaminase) are two enzymes that are able to metabolize blood glutamate, facilitating the lowering of extracellular levels of glutamate in the brain. The inverse correlation observed between GOT and GPT levels with blood glutamate levels, together with the association between GOT and GPT levels with good functional outcome, could be explained by the capacity of these enzymes to reduce the neurotoxic effect of elevated glutamate levels in the brain following ischaemic stroke.

It is interesting that Zlotnik et al. [2] reported that plasma GOT and GPT levels were significantly higher in male than in the female participants. Stover and Kempski [3] also reported that, after isoflurane administration in neurosurgical procedures, glutamate concentrations were more prominently elevated in male patients than in female patients. In the paper by Campos et al. [1], the male patient ratios in the good- and poor-outcome groups were 67.3 and 49.2 % respectively ($P < 0.0001$). Considering this point, the results described by Campos et al. [1] should not be overinterpreted before the gender difference is adjusted. We have reason to suspect that the difference between the two groups was caused by gender, rather than acute ischaemic stroke.

To date, there is very little in the literature on the influence of sex or sex hormones on GOT or GPT. We propose that differences in the plasma GOT and GPT levels between men and women may be due to the effects of the female gonadal hormones oestrogen and progesterone. There is substantial biological evidence to support that oestrogen and progesterone have significant neuroprotective properties against various neurodegenerative conditions [4,5]. However, the exact mechanisms by which oestrogen and progesterone mediate their blood glutamate-reducing effect are not clear and additional studies are warranted.

REFERENCES


