Letter

Anti-inflammatory effects of the antibiotics ceftazidime and tobramycin in porcine endotoxin shock: are they really anti-inflammatory?

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Goscinski and coworkers [1] investigated whether the biological effects of exogenous endotoxin in a porcine model could be neutralized by tobramycin, and whether tobramycin or ceftazidime is able to modulate the inflammatory response. There was no neutralization of the biological effects of endotoxin in this porcine model. However, Goscinski and colleagues suggest a possible anti-inflammatory effect by both ceftazidime and tobramycin caused by a significantly greater reduction in the IL-6 plasma level response to endotoxin in comparison with the untreated group. No significant difference in peak tumour necrosis factor (TNF)-α or in rates of elimination of TNF-α between treatment groups was seen.

The greater reduction in plasma IL-6 levels could be a marker of a reduced inflammatory response. However, the lack of an effect on the levels of TNF-α questions the conclusion drawn regarding a reduction in the inflammatory response. IL-6 has long been regarded as a proinflammatory cytokine induced by lipopolysaccharide, along with TNF-α and IL-1. However, although IL-6 is a potent inducer of the acute-phase response, it has anti-inflammatory properties as well. Thus, IL-6 attenuates the synthesis of IL-1 and TNF-α while having little effect on the synthesis of anti-inflammatory cytokines such as IL-10; it promotes the synthesis of IL-1 receptor antagonist and soluble TNF receptor release in human volunteers. The net results of these immunological effects place IL-6 among the anti-inflammatory cytokine group [2]. It was shown that IL-6, rather than playing a lethal role, protected mice against death in a septic shock model [3]. Therefore, the authors' suggestion that the reduction in IL-6 plasma levels in response to exogenous endotoxin by the antibiotics ceftazidime and tobramycin may be beneficial in the treatment of sepsis is questionable, because the reduction in an anti-inflammatory cytokine may promote the proinflammatory response, and hence adversely affect its pathophysiology.

Competing interests

None declared.

References

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IL = interleukin; TNF = tumour necrosis factor.