Human serum albumin improves endothelial dysfunction and survival during experimental endotoxemia: Concentration-dependent properties

Titre	Human serum albumin improves endothelial dysfunction and survival during experimental endotoxemia: Concentration-dependent properties
Type de publication	Article de revue
Auteur	Kremer, Hélène [1], Baron-Menguy, Céline [2], Tesse, Angela [3], Gallois, Yves [4], Mercat, Alain [5], Henrion, Daniel [6], Andriantsitohaina, Ramaroson [7], Asfar, Pierre [8], Meziani, Ferhat [9]
Editeur	Lippincott, Williams & Wilkins
Type	Article scientifique dans une revue à comité de lecture
Année	2011
Date	2011/06
Numéro	6
Pagination	1414 - 1422
Volume	39
Titre de la revue	Critical Care Medicine
ISSN	0090-3493

Résumé en anglais	Objectives: The mechanisms by which human serum albumin might protect against sepsis-induced organ dysfunction and improve survival are not elucidated. The present study was designed to assess the effects of two concentrations of human serum albumin on endotoxin-induced mortality as well as on endothelial and organ dysfunctions in both mouse and cell models.Design: Prospective, randomized, controlled experimental study. Setting: University research laboratories. Subjects: Swiss mice (n = 10–15/group) were injected with either lipopolysaccharide or vehicle. Four and 12 hrs later, mice were infused or not with human serum albumin HSA (4% or 20%, 10 mL/kg) or normal saline (0.9% NaCl, 30 mL/kg). Human uterine vein endothelial cells were exposed to both lipopolysaccharide and tumor necrosis factor-α during 8 hrs in the presence or absence of human serum albumin (4% or 20%). Measurements and Main Results: Mice survival, reactivity of mesenteric arteries, and Western blot protein analysis were assessed. Circulating endothelin-1, gluthatione, gluthatione disulfide, and creatinine plasma levels were measured. Nitric oxide production, oxidative, and nitrosative stresses were also measured in situ in endothelial cells. Human serum albumin 4%, but not human serum albumin 20% or normal saline solution, improved survival time of endotoxemic mice. Furthermore, human serum albumin 4% activated endothelial nitric oxide synthase and restored lipopolysaccharide-impaired flow-dependent endothelial dilation in mesenteric arteries. This was associated with a downregulation of nuclear factor κB and an upregulation of nuclear respiratory factor-2 and heme oxygenase-1. Human serum albumin 4% reduced lipopolysaccharide-induced renal dysfunction, enhanced endothelin-1 production and glutathione plasmatic levels, whereas human serum albumin 20% increased gluthatione disulfide. Furthermore, human serum albumin 4% but not 20% blunted lipopolysaccharide-tumor necrosis factor-α-induced oxidative and nitrosative stresses in endothelial cells and increased their gluthatione levels. Conclusions: The present data confirm a protective effect of 4% human serum albumin treatment both on mice survival and endothelial dysfunction by inhibiting inflammatory and oxidative stress pathways induced by endotoxins. Conversely, higher concentrations of human serum albumin were detrimental suggesting a dose-dependent effect.
URL de la notice	http://okina.univ-angers.fr/publications/ua300 [10]
DOI	10.1097/CCM.0b013e318211ff6e [11]
Lien vers le document	http://dx.doi.org/10.1097/CCM.0b013e318211ff6e [11]
Titre abrégé	Human serum albumin improves endothelial dysfunction and survival during experimental endotoxemia

---

Liens

[1] http://okina.univ-angers.fr/publications?f[author]=928
[2] http://okina.univ-angers.fr/publications?f[author]=929
[3] http://okina.univ-angers.fr/publications?f[author]=124
[4] http://okina.univ-angers.fr/publications?f[author]=754
[5] http://okina.univ-angers.fr/publications?f[author]=930
[6] http://okina.univ-angers.fr/d.henrion/publications
[7] http://okina.univ-angers.fr/r.andrian/publications
[8] http://okina.univ-angers.fr/pi.asfar/publications
[9] http://okina.univ-angers.fr/publications?f[author]=932
[10] http://okina.univ-angers.fr/publications/ua300
[11] http://dx.doi.org/10.1097/CCM.0b013e318211ff6e