

GizmmR...H F H D U'3'ö` @Q='I p` € F P ...p Âp•F H P'WÄD W L U G W\$W G` € 0 I
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Short Review on the Protection by Ouabain of *E. Coli* Toxins

Amaral MM¹, Girard MC¹, Álvarez RS¹, Paton AW², Paton JC², Repetto HA^{3*}, Sacerdoti F

Nowadays, there is a PCR technique to rapidly determine the presence of Shiga toxin in the stools of a child with diarrhea. This may allow the rapid addition of OUA, hopefully before the microangiopathic lesion has been produced.

1. Rivas M, Chinen I, Miliwebsky E, Masana M (2014) Risk factors for shiga toxin-producing *Escherichia coli*-associated human diseases. *Microbiol Spectr* 2
2. Bitzan M (2009) Treatment options for HUS secondary to *Escherichia coli* O157:H7. *Kidney Int Suppl* 112: S62-S63
3. Silberstein C, Copeland DP, Chiang WL, Repetto HA, Ibarra C (2008) A glucosylceramide synthase inhibitor prevents the cytotoxic effects of Shiga toxin-2 on Human Renal Tubular Epithelial Cells. *J Epithelial Biol Pharmacol* 1: 71-75
4. Silberstein C, Lucero M, Zotta E, Copeland DP, Lingyun L, et al. (2011) A glucosylceramide synthase inhibitor protects rats against the cytotoxic effects of Shiga toxin 2. *Pediatr Res* 69: 390-394
5. Karmali MA, Petric M, Lim C, Fleming PC, Arbus GS, et al. (1985) The association between idiopathic hemolytic uremic syndrome and infection by verotoxin-producing *Escherichia coli*. *J Infect Dis* 151: 775-782
6. Paton AW, Srimanote P, Talbot UM, Wang H, Paton JC (2004) A new family of potent AB(5) cytotoxins produced by shiga toxinogenic *Escherichia coli*. *J Exp Med* 200: 35-46
7. Paton AW, Beddoe T, Thorpe CM, Whisstock JC, Wilce MC, et al. (2006) AB5 subtilase cytotoxin inactivates the endoplasmic reticulum chaperone BiP. *Nature* 443: 548-552
8. Amaral MM, Sacerdoti F, Jancic C, Repetto HA, Paton AW, et al. (2013) Action of shiga toxin type-2 and subtilase cytotoxin on human microvascular endothelial cells. *PLoS ONE* 8: e70431.
9. Marquez LB, Velazquez N, Repetto HA, Paton AW, Paton JC, et al. (2014) Effects of *Escherichia coli* subtilase cytotoxin and shiga toxin 2 on primary cultures of human renal tubular epithelial cells. *PLoS ONE* 9: e87022
10. Jones NL, Islur A, Haq R, Mascarenhas M, Karmali MA, et al. (2000) *Escherichia coli* shiga toxins induce apoptosis in epithelial cells that is regulated by the bcl-2 family. *Am J Physiol Gastrointest Liver Physiol* 278: G811-G819
11. May KL, Paton JC, Paton AW (2010) *Escherichia coli* subtilase cytotoxin induces apoptosis regulated by host bcl-2 family proteins bax/bak. *Infect Immun* 78: 4691-4696
12. Burlaka I, Liu XL, Rebetz J, Arvidsson I, Yang L, et al. (2013) Ouabain protects against shiga toxin-triggered apoptosis by reversing the imbalance between Bax and Bcl-xL. *J Am Soc Nephrol* 24: 1413-1423
13. Maria MA, Magali CG, Romina SA, Adrienne WP, James CP, et al. (2017) Ouabain Protects Human Renal Cells against the Cytotoxic Effects of Shiga Toxin Type 2 and Subtilase Cytotoxin. *Toxins (Basel)* 9: 226