Proceedings of the British Pharmacological Society at http://www.pA2online.org/abstracts/Vol14Issue2abst010P.pdf

Vascular function of rat uterine arteries is enhanced by pregnant HDL, but not by non-pregnant HDL

Introduction: High density lipoprotein (HDL) protects the vascular endothelium in non-pregnant individuals. Pregnant women have an enhanced endothelial function despite the metabolic changes that occur in pregnancy. **Hypothesis:** HDL plays a role in maintaining endothelial function in healthy pregnancy and in complicated pregnancy such as pre-eclampsia; HDL fails to provide vascular protection. **Aims:** This study compared the effects of HDL from healthy pregnant and non-pregnant women on rat uterine artery (UA) function. **Methods:** HDL was isolated from plasma of healthy pregnant women and non-pregnant women using 2-stage sequential ultracentrifugation and was desalted on PD-MiniTrap G-25 columns. UA from gestational day 18 WKY rats and aged-matched WKY non-pregnant rats were incubated with physiological salt solution and pregnant and non-pregnant HDL. The response of the UA was assessed by small wire myography after exposing the vessels to increasing dose of noradrenaline 10^{-9}M-10^{-5}M (as vasoconstrictor) and carbachol 10^{-8}M-10^{-5}M (as vasodilator). **Results:** In non-pregnant rat UA, pregnant HDL significantly reduced contractility of the arteries (n=9) as compared to non-pregnant HDL (n=5) [maximal mean wall tension (standard error) 5.0 (0.31) vs 6.9 (0.38) mN/mm, p=0.004]. Non-pregnant arteries exposed to pregnant HDL (n=9), showed significantly increased relaxation towards 10^{-5}M carbachol compared to arteries exposed to non-pregnant HDL [max % relaxation (standard error) 70.2 (6.6) % vs 43.2 (7.2) % p=0.021]. Pregnant rat UA, exposed to pregnant HDL showed reduced contractile response to noradrenaline 10^{-5}M compared to UA exposed to non-pregnant HDL [5.03 (0.56) vs 7.04 (0.31) mN/mm, p=0.035], but there was no difference in vessel relaxation to carbachol 10^{-5}M [57.8 (9.5) % vs 56 (4.8) %; p=0.88). **Conclusion:** This preliminary study provides evidence that pregnant HDL enhances rat uterine artery function to a greater degree than non-pregnant HDL. The protective effect of pregnant HDL on vessel function will now be studied in human vessels.