Vessels and Endothelium

12.6 Resistance Artery Remodelling in Young Spontaneously Hypertensive Rats is Prevented with Chronic Treatment with Heparin

G.E.M. Boari (1), P.M.H. Schiffers (2), G. Fazzi (2), D. Rizzoni (1), E. Agabiti Rosei (1), J.G. De Mey (2)

(1)Dipartimento di Scienze Mediche e Chirurgiche - Università degli Studi di Brescia, Brescia, Italy, (2)Dipartimento di Farmacologia e Tossicologia, Università di Maastricht, Maastricht, Netherlands

Introduction. There is strong evidence that chronic heparin treatment lowers blood pressure in spontaneously hypertensive rats (SHR). It is not known whether this treatment, administered before the development of overt hypertension, is able to prevent vascular remodelling and mechanical alterations typical for this condition. This was tested in the present study.

Methods. Twenty-four 4 weeks old rats were included in the study, 12 SHR and 12 normotensive Wistar-Kyoto (WKY) rats. Half were implanted with a subcutaneous osmotic mini-pump that delivered 60 U/day of heparin for a period of 8 weeks. Mesenteric resistance arteries were harvested and mounted on a pressure myograph. Pressure/diameter (P/D) curves from 20 to 130 mmHg were constructed in the absence of tone and wall-to-lumen ratio (W/L) was determined at a transmural pressure of 80 mmHg (figure).

Results. There was a significant ($p=0.003$) upward shift of the P/D curve in treated SHR (HepSHR) compared to control SHR (CntSHR). No significant difference was detected between treated (HepWKY) and control WKY, although a trend was observed. Wall to lumen ratio was significantly smaller in treated SHR compared to the control group (HepSHR 0.061 ± 0.012 vs CntSHR 0.082 ± 0.012 ; $p=0.02$) and similar to control WKY (cntWKY 0.067 ± 0.025 ; $p=NS$). No significant difference was found between treated and untreated WKY.

Conclusions. Chronic treatment at young age with a low dose of heparin prevents the development of resistance artery structural changes in SHR