54) Plasma Corticoid (CS) Profile in Spontaneously Hypertensive Rat (SHR) Analyzed by High Performance Liquid Chromatography (HPLC). Zenzo Saito, Sensyu Hifumi^{*}, Naonori Mimou^{*}, and Ryoyu Takeda^{*}, The School of Allied Medical Professions, and the Second Department of Internal Medicine, School of Medicine^{*}, Kanazawa University, Kanazawa-shi 920.

Although much research has been done on possible involvement of CS in the pathogenesis of hypertension of SHR, the mechanism remains obscure. Besides, studies of adrenal steroidogenesis in SHR have produced rather paradoxical results. Recently Komanicky, et al. (1) described the possible alterations of adrenal steroidogenesis in young SHR which may be causative in the development of hypertension. In the present paper, we analyzed the CS profile using HPLC and measured prolactine (PRL) levels in the identical plasma of SHR.

4~32-week-old male SHR and age matched Wister Kyoto (WKY) normotensive controls were supplied to collect the blood into heparinized tubes following rapid decapitation. The CS extracted with 6 volumes of ethyl acetate from the plasma were analyzed and quantitated by a semi-automated HPLC (2 and 3) using detector of UV 254 nm, Sorbax-SIL and Sorbax-CN columns, and two carrier systems of cyclohexane-dichloromethane-ethanol (9:4:1) as ordinary phase and 50% methanol as reversed phase for those columns. Plasma PRL was measured by double-antibody radioimmunoassay provided by NIAMDD, NIH. The blood pressure were taken using the tail cuff method.

Results; systolic blood pressure in SHR began to rise before 8 weeks of age and continued to rise with age, whereas blood pressure in WKY plateaued at 12 weeks. More than 15 UV absorbed peaks were identified in plasma chromatographically using their identical retention time as Corticosterone (B), 18-hydroxy-deoxycorticosterone (18-OH-DOC), DOC, Aldosterone (Aldo), 18-OH-B, Progesterone and other CS. plasma levels of B in SHR kept lower than those in WKY and 18-OH-DOC levels in SHR continued to increase with age. Plasma CS ratios in SHR were calculated. 18-OH-DOC/B increased with age, contrarily, the B/(DOC+B) and Aldo/(Aldo+B) decreased gradually (Fig.1). On the other hand, plasma PRL levels in all SHR were higher than those in WKY (Fig.2).

Conclusively, secretion of 18-OH-DOC in SHR increased relatively more than B, possibly relating with increased PRL levels in plasma. These results suggest that in biosynthetic pathways from DOC to [1] 18-OH-DOC and to [2] Aldo, alternative pathway [1] might overtake [2] with age in SHR and a certain mechanism which affects PRL secretion might take part in the alteration of the CS biosynthesis.

Fig.1. Plasma 18-OH-DOC/B ratio

Fig.2. Plasma prolactine levels

References

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