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<td>川島, 紘一郎(Kawashima, Koichiro) 三輪, 裕子(Miwa, Yuko) 藤本, 和子(Fujimoto, Kazuko)</td>
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<td>大畑, 尚代(Ohata, Hisayo) 西野, 弘四(Nishino, Hiroshi) 小池, 博之(Koike, Hiroyuki)</td>
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<tr>
<td><strong>Abstract</strong></td>
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metched WKY rats. However, no significant differences between the strains were seen in ACh contents at any ages in all the regions tested. In the anterior hypothalamus of SHR rats, the content of ACh at 15 weeks of age was significantly lower when compared to that at 5 weeks of age. In the medulla oblongata-pons region, ACh contents in both SHR and WKY rats were significantly decreased with age.

The decrease in ACh content in the anterior hypothalamus found in SHR rats after the development of hypertension could be due to the increased release of ACh reflecting the activation of cholinergic function in that area of the brain and might be causally related to the tonic rise in arterial pressure. Alternative possibility is that the synthesis of ACh in that area of the brain might be decreased as the results of sustained elevation of BP. In summary, our data demonstrate the alteration of the cholinergic function in the anterior hypothalamus of adult SHR rats possibly in relation with BP elevation.

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Reduction of Blood Pressure by Melatonin in Spontaneously Hypertensive Rats.

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Introduction Several reports have suggested that melatonin may be involved in the blood pressure regulation as an endogenous hypotensive factor. Furthermore, decreased serum melatonin concentration has been reported in essential hypertension. Recently, we have observed a decrease in nocturnal serum melatonin in spontaneously hypertensive (SHR) rats after the development of hypertension compared to age-matched normotensive Wister Kyoto rats (Kawashima et al., Clin Exp Hyper A6: 1517, 1984). It now appears likely that abnormality in melatonin secretion may be related to the pathogenesis of hypertension. In the present study, we investigated the effect of melatonin on blood pressure in adult SHR rats.

Methods Male SHR rats (23-week-old) were maintained on standard rat chow and tap water ad libitum and kept under 14 hours of light (7—21 hours) and 10 hours of darkness (21—7 hours) daily. An indwelling catheter was inserted into the lower abdominal aorta through the left femoral artery under anesthesia with pentobarbital. Two days after surgery (on Day 0), control blood pressure was determined for 24 hours through the
arterial catheter using a pressure transducer and heart rate was measured by a cardio-
tachometer triggered with the pulse pressure. Then, rats were randomly assigned into
two groups, and infused intraperitoneally either with melatonin at the rate of 6 mg (about
20 mg/kg) per day or the vehicle (polyethylene glycol 200, 24 μl per day) by a minipump
(ALZETR). On Day 2 and Day 5 (24 and 96 hour after the beginning of melatonin infusion),
24-hour blood pressure and heart rate were monitored as described above.

Results Before the treatment with vehicle (n=7) or melatonin (n=6), no significant
differences were observed in blood pressure (196±5 vs. 194±3 mmHg) and heart rate
(309±12 vs. 326±8 beats/min) between the groups. On Day 2, blood pressure in
melatonin treated rats was lower than that in control rats by about 10 mmHg. Significant
reduction was observed at several points of the determination (P<0.05). Heat rate in
melatonin treated rats was also lower than that in control rats, but there was no signifi-
cant difference. On Day 5, melatonin produced a significant decrease in blood pressure by
about 15 mmHg compared to vehicle at most points of the measurement (P<0.05 or 0.01).
A significant decrease in heart rate by melatonin was observed at several points of the
determination when compared to vehicle (P<0.05).

Discussion The results of the present study demonstrate that melatonin has a
hypotensive action in adult SHR rats. Decreased serum melatonin reported in essential
hypertension and in adult SHR rats, and the data in present studt support the possibility
that alterations in melatonin secretion is causally related to the development of hyperten-
sion. The facts that antihypertensive effect of melatonin developed gradually and that
significant reduction of heat rate was always associated with significant decrease in blood
pressure suggest that melatonin may induce a reduction of sympathetic outflow through
indirect mechanism. Effect of melatonin on plasma renin activity is under investigation.

Conclusion Melatonin has an activity to reduce blood pressure and heat rate in
adult SHR rats, thereby indicating a role in blood pressure regulation at least in SHR
rats.

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生体内低分子化合物のラジオイムノアッセイと問題点

川島銑一郎

[第29回 日本薬学会関東支部会（昭和60年11月9日、東京）で発表]

はじめに

Yalow と Berson によって血漿インスリン濃度測定のための、最初のラジオイムノアッセイ
(RIA) が開発されて以来すでに四半世紀が経過した。この間に RIA は、すぐれた感度と特異性
および操作が簡便であるので、多数の生体内物質や薬物などの測定に広く応用されてきた。しか

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