Effects of Reduced Aldosterone on Organ Damage in Hypertensive and Normotensive Rats

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The two adrenal glands are endocrine glands located on the top of both kidneys. The adrenal glands secrete several hormones which include aldosterone. Aldosterone, secreted from the outer layer of the adrenal cortex is responsible for sodium, water and potassium balance in the body. Increased levels of aldosterone in the blood causes an increase in sodium reabsorption which stimulates an increase in water retention. This leads to an increase in blood volume which in turn leads to a higher blood pressure. Aldosterone is also reported to have a role in cardiac fibrosis (scarring) and tissue damage. The goal of this project was to determine the effect of reduced aldosterone on the heart and kidneys of hypertensive and normotensive rats, using a process of adrenal freezing to lower aldosterone levels. Surgery was performed on 6 weeks old rats using sterile techniques. The adrenal gland on the right side was carefully removed and the incision was closed. The outer layer of the adrenal gland on the left side was destroyed by freezing it with liquid nitrogen. The gland was returned to the original position and the incision closed. A sham surgery was also performed on rats by surgically opening and closing the rats in the same way, but leaving the adrenal glands undisturbed. After at least 8 weeks post surgery, resultant changes in the heart and kidneys were studied. The results showed that heart weight and ventricular length was greater in the sham rats compared to the adrenal frozen rats. Adequate aldosterone appears to be necessary for appropriate ventricular growth. The kidney weight was greater in the adrenal frozen rats compared to the sham rats.

Additional Abstract Information

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