

The blood samples were taken in double oxalate tube just before injection and subsequently at 5, 10, 15 and 30 minutes followed by 30 minutes interval upto 180 minutes. The total plasma protein and albumin content were measured by the methods described by Wootton (14).

RESULTS

Effect of intravenous administration of angiotensin II in normal dogs:

In eight normal anaesthetized dogs administration of angiotensin caused a decrease in total plasma protein and albumin content. The decrease was obtained within 10 minutes reaching to the maximum fall within 30 minutes which did not return to the control level upto 180 minutes (Table I, Fig. 1).

TABLE I: Effect of intravenously administered angiotensin II on total plasma protein and albumin content in dogs under different experimental procedures.

No. of experiments	Experimental procedure	Normal total plasma proteins in g/100 ml of plasma Mean value \pm SD	Maximum decrease in total plasma proteins in g/100 ml of plasma Mean value \pm SD	Normal albumin content in g/100 ml of plasma Mean value \pm SD	Maximum decrease albumin content in g/100 ml of plasma Mean value \pm SD
8	Normal	8.4 \pm 0.6	5.8 \pm 0.5*	5.9 \pm 0.7	4.0 \pm 0.5**
8	Spinal section and vagotomy	8.2 \pm 0.5	5.6 \pm 0.7*	6.4 \pm 0.6	4.4 \pm 0.6**
8	Splenectomy	8.4 \pm 0.7	6.0 \pm 0.4*	5.9 \pm 0.5	4.2 \pm 0.4**
8	Adrenalectomy	8.6 \pm 0.5	6.2 \pm 0.6*	5.8 \pm 0.7	4.1 \pm 0.6**
8	Nephrectomy	8.5 \pm 0.6	8.2 \pm 0.7***	6.1 \pm 0.6	5.9 \pm 0.4***

*P < 0.01

**P < 0.05

***P > 0.1

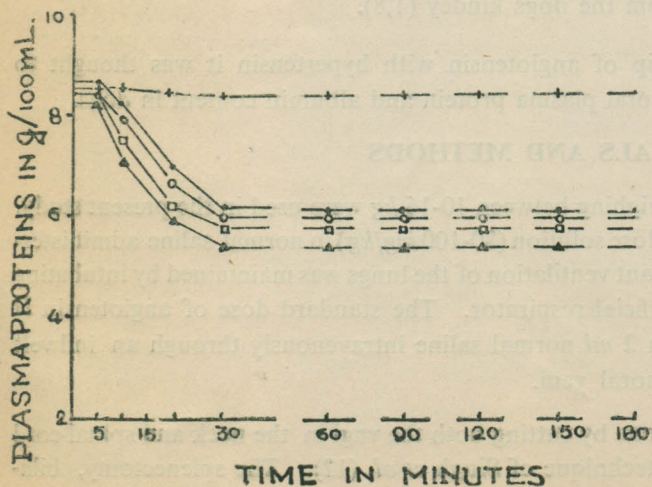


Fig. 1: Effect of intravenous administration of angiotensin on total plasma protein level in dogs under different experimental procedures.

Normal □ — □

Spinal and vagotomy ▲ — ▲

Splenectomy ○ — ○

Adrenalectomy ● — ●

Nephrectomy + — +

Effect of intravenous administration of angiotension II following spinal and bilateral vagotomy, splenectomy and adrenalectomy:

Following spinal and vagotomy, splenectomy and adrenalectomy in eight anaesthetized dogs of each group, angiotensin again produced a fall in total plasma protein and albumin level. The decrease was observed within 10 minutes reaching to its maximum fall within 30 minutes. The decrease in total plasma protein and albumin level persisted till 180 minutes (Table I, Fig. 1).

Effect of intravenous administration of angiotensin II following bilateral nephrectomy:

In eight anaesthetized and nephrectomized dogs angiotensin did not cause any significant decrease in total plasma protein and albumin content (Table I, Fig. 1).

DISCUSSION

In the present study intravenous administration of angiotensin caused a significant decrease in total plasma protein ($P < 0.01$) and albumin content ($P < 0.05$). Similar result was also obtained in spinal and vagotomized dogs indicating that nervous connections have no role in decreased plasma protein and albumin content. Angiotensin has been reported to have a central as well as peripheral site of action and that it acts via central vagal inhibition (11). The failure of vagotomy to reduce the angiotensin response in the present experiments argue against a significant central component to the response.

In splenectomized and adrenalectomized dogs intravenously administered angiotensin again caused a significant fall in plasma protein ($P < 0.01$) and albumin content ($P < 0.05$) indicating that spleen and adrenal glands do not play any significant role in decreased plasma protein and albumin level in dogs. Angiotensin stimulates the release of catecholamines from the adrenal medulla of several species (6,13). The present results in dog show that medullary catecholamines do not constitute towards this action of angiotensin as evidenced by persistence of the effect after adrenalectomy. Day and Owen (5) have also reported non-involvement of catecholamines in the acute pressor response to angiotensin.

Intravenous administration of angiotensin produces a marked vasoconstriction by its direct action on vascular smooth muscles (4). It is suggested that angiotensin induced effect may be associated with increased secretion of prostaglandin-like substances from the dog's kidney. The prostoglandin-like substances bring about an increase in permeability of endothelium of blood vessels causing leakage of fluid and plasma proteins, specially albumin which has comparatively smaller molecular size, into interstitial spaces resulting into a decrease in plasma protein and albumin level. This contention is sustained by the fact that the effect was not observed in nephrectomized dogs ($P > 0.1$).

The increased secretion rate of prostaglandin-like substances from the dog kidney by angiotensin II has been reported by a number of workers (1,8).

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