



Fig. 1. Concentration of corticotropin-releasing factor-like immunoreactivity in rat intermediate and posterior pituitary lobes after stalk section. Values represent mean \pm SEM of duplicate determinations from two tissue dilutions taken from individual animals. * $p < 0.01$, Student's *t* test.

serum albumin. Aliquots of the supernatant (100 μ l) were incubated at 4 $^{\circ}$ C in the presence of 100 μ l of CRF antibody (final dilution 1:6,000) for 24 h. Subsequently, 100 μ l of 125 I-Tyr-CRF (ovine, 8,000 cpm) was added and the samples were incubated for 24 h at 4 $^{\circ}$ C. The antigen-bound antibody was separated from the free antigen by addition of 100 μ l of normal rabbit serum (1/100), 100 μ l of anti-rabbit λ -globulin from goat (1/10), and 1 ml of 6% polyethylene glycol 8000, at 0 $^{\circ}$ C. In a typical assay, ID₅₀ was 25 pg. Average of nonspecific binding was 1%. 4–6 pg could be reliably detected. Serial dilutions of pituitary tissue extracts produced parallel curves to ovine antigen standard [Dray et al., in preparation].

Results

The intermediate and posterior lobes of sham-operated rats contained similar total amounts of CRF-like immunoreactivity (65.7 ± 6.9 and 52 ± 6.0 pg per lobe, respectively). Total transection of the pituitary stalk resulted in very marked decreases in CRF-like immunoreactivity, 7 days after the lesion. These changes were evident either when expressed as total tissue content (7.3 ± 0.8 pg, an 89% decrease, in the intermediate lobe, and 6.9 ± 0.5 pg, an 87% decrease, in the posterior lobe) or when expressed as peptide concentration per milligram of protein (fig. 1). Protein content did not change after stalk section in the intermediate lobe (from 111.2 ± 8.1 to 117.2 ± 6.1 μ g), but decreased by 29% in the posterior lobe (from 107.6 ± 4.4 to 76.9 ± 7.0 μ g, $p < 0.01$, Student's *t* test). No CRF-like immunoreactivity could be detected in the anterior lobe of sham-operated or pituitary stalk-sectioned rats.

Discussion

Our findings indicate that most of the intermediate and posterior pituitary CRF-like immunoreactivity was localized in nerve fibers of brain origin. Earlier studies [1] indicated the presence of peptidergic nerves in the posterior pituitary. CRF-positive immunoreactive fibers have been recently detected in the pituitary stalk and in the posterior pituitary [2, 3, 5]. These observations, together with ours, indicate that CRF could have a role in the regulation of posterior pituitary function.

On the contrary, no CRF-positive nerve terminals could be detected in the intermediate lobe by immunohistochemical techniques [3]. However, CRF stimulates the release of peptides from the intermediate lobe of the rat pituitary [6]. Our findings indicate that CRF-like material is indeed present in the rat intermediate pituitary lobe, and that most of the peptide is probably located in nerve fibers of brain origin. These observations support the hypothesis of a role of CRF-containing nerves in the regulation of intermediate lobe function.

References

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