Effects of Sheep Pineal Fractions on the Activity of Male Rat Hypothalami in vitro


Equipe de Neuroendocrinologie du C.N.R.S., Laboratoire d'Histophysiologie du Collège de France, Paris, France; Laboratory of Biochemistry of Reproduction, Utrecht, The Netherlands, and Department of Organic Chemistry, University of Utrecht, Utrecht, The Netherlands

With 4 Figures

Received February 26, 1979

Summary

High molecular weight substances could be isolated from sheep pineals with the "Bensinger" extraction method, followed by ultrafiltration of the waterlayer through different dialomembranes.

Two of the pineal fractions, XM100R and PM30R, stimulate the gonadotropin releasing activity of the medial basal hypothalamus (MBH).

In experiments in which comparable pineal fractions were incubated without MBH and without pituitary and injected in immature mice no effect was detectable. All experiments in which a similar amount of rat cerebral cortex was used for incubation with pineal fractions did not show any activity.

Key words: Pineal fractions, hypothalamic, gonadotropin releasing activity, bioassay in vitro, radioimmunoassay.

Introduction

Some years ago we detected an effect of sheep pineal fractions on rat and mice hypothalami in vitro (Moszkowska et al., 1973; Citharel et al., 1973). Later on it was possible to separate these fractions on

* Present address: Unité de Neuroendocrinologie, 2ter Rue d'Alésia, Paris 750 14, France.
Sephadex G-10 columns in two different subfractions (Ebels et al., 1975). These experiments were all carried out with aqueous sheep pineal fractions, extracted and separated as much as possible in darkness at 4 °C and, if light was needed, under normal fluorescent bulb-light. Recently, we have isolated a pteridine from a low molecular weight fraction of an aqueous sheep pineal extract. Its structure is most probably identical with 6-L-erythrobiopterin (Van der Have-Kirchberg et al., 1977). As pteridines are known to be very light-sensitive compounds, which can easily be transformed into other biologically active structures (Lowry et al., 1949; Blakley, 1969) we now extracted and separated our sheep pineals in dim red light (wavelength > 600 nm, see Spectrum I) and as much as possible in darkness at 4 °C.

Last year we compared the activity of acetic acid and aqueous bovine pineal extracts with extracts prepared according to a method first published by Bensinger et al. (1973). With that method more fractions showing inhibitory activity on compensatory ovarian hyper trophy after unilateral ovariectomy were obtained than with a simple extraction with dilute acetic acid as we prepared before. For details of these experiments see Ebels et al. (1978) and Ebels et al. (1979). In this paper we present the effects of sheep pineal fractions extracted with the "Bensinger" method on rat hypothalami in vitro.

Materials and Methods

Sheep pineals were collected by ERSCO, San Mateo, California, in the winter months of 1977.