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The neurosecretory pathway of the hypothalamo-hypophyseal system had been considered to be made up by non-myelinated nerve fibers. However, ROMEIS (1940) found myelinated fibers in this tract in one of 100 human pituitary glands, and SPULER (1951), BECKER (1955) and TAMIYA, IMOTO and OKA (1956) reported on the presence of myelinated nerve fibers in the hypothalamo-hypophyseal neurosecretory pathway of the guinea-pig, mouse, rabbit and rat. All these observations were done with the light microscopic method and no electron microscopic study on this problem has been reported. When we studied with the electron microscope on the neurosecretion of rabbits, some myelinated nerve fibers were found.

I. Materials and Methods.

Some female rabbits weighing about 2.0—3.0 kg were used in this study. After decapitation, small pieces of the neurohypophysis, supraoptic nuclei and infundibulum were fixed for 2 hours in PALADE’s buffered osmium solution, dehydrated through increasing concentrations of alcohol, and embedded in a mixture of one part methyl and 9 parts butyl methacrylate. Sections cut with a J. U. M. 4 ultramicroscope, were examined with a J. E. M. 4A type electron microscope.

II. Observations and Comments.

In the posterior lobe of the rabbit, as written in numerous papers (GREEN and VAN BREEMEN 1955, DUNCAN 1956, PALAY 1957, FUJITA 1957, BARGMANN and KNOOP 1957, BARGMANN, KNOOP and THIEL 1957, HARTMANN 1958, BRETTSCHNEIDER 1958 VAN BREEMEN and MAXWELL 1958, FUJITA and HARTMANN 1960), many cross sections of the nonmyelinated nerve fibers having osmiophilic granules of 100—200 μm in diameter and mitochondria with lamellar crests are observed. (Fig. 1). These granules have been considered by many workers as neurosecretory substances. The non-myelinated nerve fibers are in contact with one another or with the cytoplasma of a pituicyte by a double membrane (Fig.1).

In the central zone of the infundibulum, we can find a number of non-myelinated nerve fibers having osmiophilic granules same as in the posterior lobe (Fig. 2, 3 and 4). Sometimes large fibers with numerous granules, considered as HERRING’s
bodies, are seen here and there (Fig. 2). However, in some sections of the infundibulums of all rabbits, a few myelinated nerve fibers mixed with non-myelinated ones are noticed (Fig. 2, 4 and 5). It is difficult to decide precisely where the tract of the myelinated fibers situates in the infundibular region. The myelin sheaths of these fibers consisting of osmiophilic lamellae are not so thick as those in the other region of the central nervous system and are of 100—300 mμ in thickness.

Fig. 1. Pituitary posterior lobe of a rabbit. Cross sections of non-myelinated nerve fibers having many secretory granules are in contact with the cytoplasm of a pituicyte by a double membrane. n nucleus of a pituicyte, nf non-myelinated nerve fiber. ×35000
Some of the myelinated nerve fibers have osmiophilic secretory granules quite same as those in the non-myelinated one (Fig. 5). By light microscopy, TAMIYA, IMOTO and OKA (1956) reported that neurosecretory substances are transported in the myelinated nerve fiber as well as in the non-myelinated one. Our electron microscopic observations agree with their light microscopic view in this point. Occa-
sionally, large myelinated nerve fibers containing abundant secretory granules are noticed. We consider that HERRING's body is made by an accumulation of secretory granules in the non-myelinated nerve fiber as well as in the myelinated one.

In the posterior lobe, we cannot find any myelinated fiber, but it is very dif-
Difficult to deny the presence of the myelinated fiber in this region. Since the posterior lobe is too large to examine the whole sections by the electron microscope, it is necessary to look for those very carefully. By light microscopy, TAMIYA, IMOTO and OKA (1956) found myelinated nerve fibers in the posterior lobe, especially in the 'Zwischenstreifen (ROMEIS 1940)', while BECKER (1955) reported that myelinated fibers are decreased in number near the distal portion of the hypothalamo-hypophyseal tract.

Concerning the origin of the myelinated fibers, TAMIYA, IMOTO and OKA (1956) believed that these are from the supraoptic nuclei. We can also find a few myelinated fibers in this region with the electron microscope (Fig. 6). But it is difficult to conclude that all of the myelinated nerve fibers in the infundibulum come from nucleus supraopticus.

III. Summary.

In the rabbit, myelinated nerve fibers having osmiophilic secretory granules are found in the infundibulum with the electron microscope. Their myelin sheaths are of about 100—300 mμ in thickness. Some of these fibers are considered to be origi-
nated from the nerve cells in the supraoptic nucleus.

Fig. 5. Infundibulum of a rabbit. A myelinated nerve fiber with many secretory granules (mnf) is seen. ×37750

内容自抄

兎の視床下部下垂体系を電子顕微鏡で検索したところ，その全例の腺体におい
て少数の有髓神経線維が無髓神経線維に混在しているのを認めた。標本の厚さ
は薄い（100—300 m/μ)。
この神経線維も無髓線維と同じく直径100—200 m/μのosmium 好性の分泌顆粒を有する。有髄神経線維の起源については視束上核の細胞に始まるものがあることとは確実であるが、それ以外の核に由来するものがあるかどうかについては不明である。

Fig. 6. Supraoptic region of a rabbit. myelinated nerve fibers with mitochondria are seen. ×37750
References.