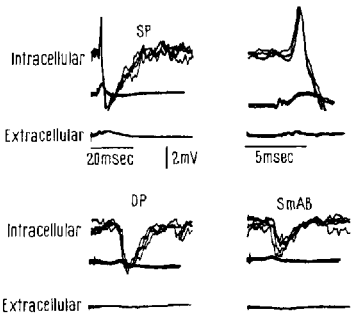
In some experiments the effect from contralateral nerves was investigated as well. It is of particular interest that interneurones activated from the ipsilateral FRA do receive IPSPs from the contralateral FRA.



Intracellular recording from an interneurone located at a depth of 2.15 mm from the cord dorsum in L7. In each record the upper traces are intracellular. The lower traces were recorded after withdrawal of the microelectrode to a just extracellular position. Middle traces are from the L7 dorsal root entry zone. Upper records were taken simultaneously at two sweep speeds. The superficial peroneal nerve (SP) is stimulated at a strength of 5 times threshold. The initial upward deflection (internal positivity) is an EPSP, which is followed by a large IPSP. Lower records, at the slower speed, show IPSPs evoked from high threshold muscle afferents of the deep peroneal nerve (DP) and the nerves to semi membranosus and anterior biceps (SMAB). IPSPs were also evoked from the 5 other muscle nerves dissected, from the sural nerve and from the posterior joint nerve. Calibration refers to the microelectrode recording. All records consist of superimposed traces.

Although IPSPs can be evoked in interneurones from group I muscle afferents and from low threshold cutaneous afferents, it is noteworthy that they are predominantly evoked from the FRA. Previous investigations have suggested a complex organization of the pathways from the FRA with inhibitory interaction between different paths from these afferents[4]. The present results show that postsynaptic inhibition in interneurones is an important mechanism for interaction between spinal pathways.

Résumé. L'enregistrement intracellulaire de l'activité des 81 interneurons localisés dans la corne postérieure et la région intermédiare de la moëlle épinière lombaire a été effectué chez des chats spinaux. Dans 76% de ces interneurons, on a trouvé des potentiels postsynaptiques inhibiteurs (IPSP's), provoqués le plus souvent par l'activation des afférences des réflexes de flexion, mais aussi des fibres afférentes d'origine cutanée à seuil bas et du groupe I des fibres musculaires.

T. HONGO, E. JANKOWSKA, and A. LUNDBERG

Department of Physiology, University of Göteborg (Sweden), March 24, 1965.

[4] R. M. ECCLES and A. LUNDBERG, Arch. ital. Biol. *97*, 199 (1959). – B. HOLMQVIST and A. LUNDBERG, Acta physiol. scand. *54*, Suppl. 186, 1 (1961). – N.-E. ANDÉN, M. G. M. JUKES, and A. LUNDBERG, Nature *202*, 1344 (1964).

The Influence of Estrogens on Scorbutic Bone Lesions in Guinea-Pigs

Introduction. Conjugated equine estrogen has been used extensively in the clinic as a hemostatic agent although the exact mechanism of action is still not clear. According to some authors[1,2] the ground substance of the connective tissue is the target of the estrogen action. The deficient ground substance formation in scorbutic guinea-pigs has been used as a model for studying this mechanism. RONA and CHAPPEL[3] described the protective action of conjugated equine estrogen against the epiphyseal bone lesions in experimental scurvy. Recently, it was suggested[4] that a synthetic estrogen, estriol sodium succinate, has a hemostatic action similar to that reported following the use of equine estrogen. It appeared therefore interesting to compare the protective effect of conjugated equine estrogen with estriol sodium succinate on scorbutic bone lesions.

Methods. 88 male guinea-pigs (400–550 g) – divided into 3 groups – were maintained on an ascorbic acid deficient diet (Nutritional Biochemicals, Cleveland, Ohio) for 22 days while receiving the following treatment: (1) Control – 0.6 ml distilled water; (2) 1 mg estriol sodium succinate in 0.6 ml distilled water; (3) 1 mg conjugated equine estrogen in 0.6 ml distilled water. Ten intraperitoneal injections were administered during the experimental period (approximately every second day). (Equal doses were selected for both estrogens since they are recommended clinically in the same dose.)

At the end of the experiment autopsy was performed and both knee joints were taken and fixed in Bouin's solution. After decalcification the sections were stained with Hematoxylin-eosin and Colloidal iron stains[5]. Some slides were also studied after toluidine blue and periodic acid Schiff methods.

Results. Several histological parameters were studied and the results are presented in the Table. The pathological changes of scorbutic animals were similar to those which have been described previously[3]. The control guinea-pigs exhibited severe epiphyseal changes. The joints and periarticular soft tissue were also involved (Figure 1). The second group of guinea-pigs on estriol sodium succinate showed changes comparable to those of

[1] M. SCHIFF and H. F. BURN, Am. med. Assoc. Arch. Otolaryng. *73*, 43 (1961).
[2] G. ASBOE-HANSEN, Physiol. Rev. *38*, 446 (1958).
[3] G. RONA and C. I. CHAPPEL, Endocrinology *72*, 1 (1963).
[4] J. F. RINEHART and S. K. ABUL-HAJ, Am. med. Assoc. Path. *52*, 189 (1951).
[5] H. POLIWODA, J. Am. med. Assoc. *182*, 315 (1962).

the controls (Figure 2). There was no evidence of any protective effect. On the other hand animals treated with conjugated equine estrogen appeared to have almost complete protection against the scorbutic bone changes and partial protection against the periarticular soft tissue manifestations of scurvy (Figure 3).

Discussion. It is evident from the results of this preliminary study that a marked difference exists between the protective action of conjugated equine estrogens and estriol sodium succinate on the bone lesions in guinea-pigs with experimental scurvy. The nature of this difference and quantitative comparative studies with other estrogens are the subjects of experiments in progress.

% Incidence of histological changes in the knee joint

		Group		
		Control	Estriol sodium succinate	conjugated equine estrogen
Joint and periarticular soft tissues	Hemorrhage	63	71	54
	Exudate	20	36	2
	Homogeneous precipitate	10	15	2
	Periosteal edema	69	90	43
	Periosteal proliferation	71	88	42
	Muscle necrosis	77	78	42
Femur and tibia	Disturbance of epiphyseal ossification	24	38	2
	Deformity of epiphyses	2	6	0
	Hemorrhage	43	42	8
	Edema	29	44	17
	Increase of mucopolysaccharides	75	67	23
	Homogeneous precipitate	75	56	5
	Atrophic spiculae	25	31	0
	Fibrous marrow	67	56	9
	Hypoplastic marrow	35	29	3
	Initial average weight of guinea-pigs (g)	493	526	521
	Final weight (g)	486	480	490

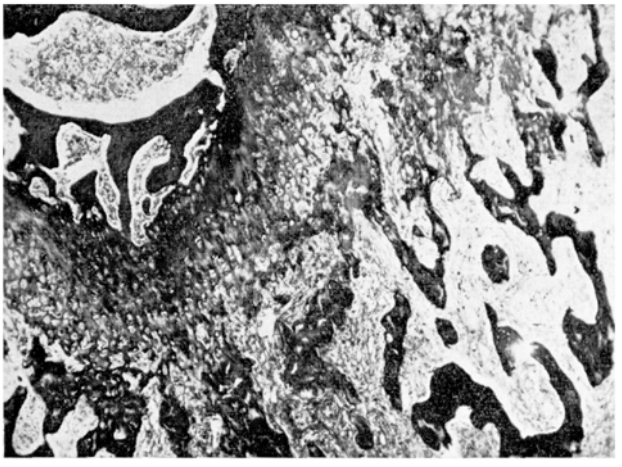


Fig. 1. Disturbance of epiphyseal ossification with homogeneous precipitate around atrophic spicules and myelofibrosis. Control group. Colloidal-iron stain × 50.

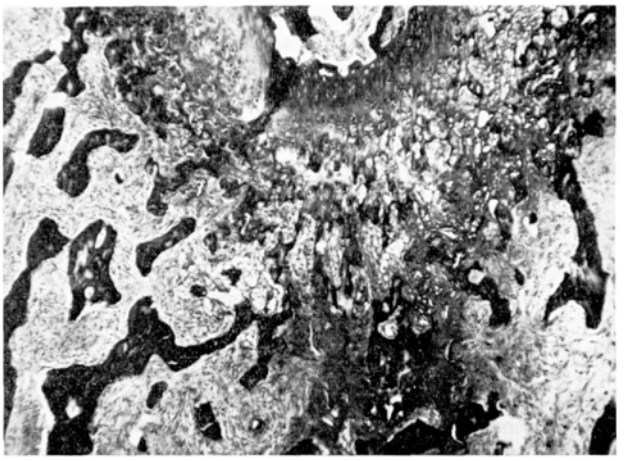


Fig. 2. Excessive disorganization of the epiphyseal plate. Estriol sodium succinate group. Colloidal-iron stain × 50.

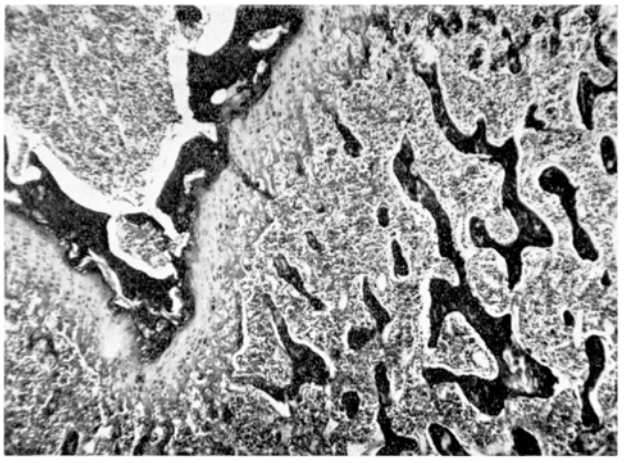


Fig. 3. Protection against the scorbutic epiphyseal lesions. Well maintained epiphyseal zones. Conjugated equine estrogen group. Colloidal-iron stain × 50.

Zusammenfassung. Konjugiertes Pferde-Östrogen zeigt eine ausgesprochen protektive Wirkung gegen epiphysäre Knochenschäden im experimentellen Meerschweinchenskorbut. Anwendung von Östriol-Natrium-Succinat von gleicher Dosis blieb ohne protektiven Einfluss.

A. Hajdu, C. I. Chappel, and G. Rona

Ayerst Research Laboratories, Montreal (Quebec, Canada), March 19, 1965.