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MEDICAL MEMORANDA

Effects of Calcitonin Therapy in Deafness Associated with Paget's Disease of Bone

W. H. MOFFATT, JOHN D. MORROW,
 NOREEN SIMPSON

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Deafness has long been recognized as a complication of Paget's disease of bone. Shai *et al.* (1971) showed that like other manifestations of the disease this may respond to calcitonin therapy and is not necessarily irreversible. We describe a case of deafness associated with Paget's disease substantially improved by calcitonin and believe this to be the first such report from the United Kingdom.

Case Report

A 73-year-old man attended the Greenisland Hospital outpatient clinic in September 1972 complaining of insidious deterioration of gait and increasing deafness after a crippling attack of sciatica in February. For the past three months he had suffered backache and paraesthesiae in the legs. A routine x-ray film in 1968 when he was symptom free had shown extensive Paget's disease of the spine.

Examination showed a small, cheerful man, badly bent and walking hesitantly with a stick. His severe deafness made history taking laborious. His blood pressure was 190/100 mm Hg and there was hypertensive scarring of both fundi. The right clavicle was prominent and enlarged. Despite his complaints his legs were normally strong and there was no evidence of pyramidal damage. Touch and pinprick sensations were impaired in the left foot and vibration sense was reduced in the left ankle. He was admitted to hospital for investigation one week later.

Haemoglobin was 16.8 g/100 ml, blood urea was 30 mg/100 ml, serum calcium and phosphate were within normal limits, and serum alkaline phosphatase was 60 King-Armstrong units. Radiographically the skull was normal but there was extensive Paget's disease of the right shoulder, lumbar spine, pelvis, and femora. He was examined at the Royal Victoria Hospital by one of us (N.S.) and issued with a hearing aid.

Calcitonin therapy was begun on 4 November, the initial dose of 40 M.R.C. units of porcine calcitonin intramuscularly twice a day being increased to 80 M.R.C. units twice daily on 23 November. Within a week of starting treatment there was subjective improvement and the patient walked without a stick or support. There was a gradual improvement in posture. The weekly serum alkaline phosphatase estimation fluctuated between 60 and 80 King-Armstrong units. When the calcitonin dosage could be reduced to 80 M.R.C. units daily he was discharged home fully independent (18 December).

Greenisland Hospital, Newtownabbey, Northern Ireland

W. H. MOFFATT, M.B., F.R.C.P.I., Consultant Physician in Geriatric Medicine

JOHN D. MORROW, M.B., B.Ch., Medical Assistant in Geriatric Medicine

Royal Victoria Hospital, Belfast

NOREEN SIMPSON, M.B., D.L.O., Medical Assistant, Audiometry Department

He regularly attended the follow-up clinic and remained symptom free. When seen on 21 March 1973 he had discarded his hearing aid and could hear a low-pitched voice at 10 ft (3 m). This satisfactory state persisted and the serum alkaline phosphatase fell to 33 King-Armstrong units. Despite his lack of symptoms the sensory deficit in the left foot remained and may have been age-related.

Comparison was made between the original pure-tone audiometry findings at the hearing-aid clinic in November 1972 and recordings in April 1973. The results are shown in the table and are substantially in accord with those of Shai *et al.* (1971), in that improvement was significant (15 db or more) in the lower frequencies while the higher frequency deficiencies were unaffected. Low-frequency improvement was more marked on the left but speech discrimination was significantly better in the right ear.

Pure-tone Audiogram Data; Air Conduction Component. Values Represent decibels required for Detection. Change of 15 db is significant

	Date	Frequency (Hz)					
		250	500	1,000	2,000	4,000	8,000
Right ear	8/11/72	60	55	50	50	80	70
	18/4/73	40	50	45	45	75	
Left ear	8/11/72	55	45	45	60	80	
	18/4/73	25	30	25	50	75	

Comment

Mayer (1913) first showed an association between deafness and Paget's disease, thus providing the stimulus for further study of the temporal bone in the disease (Anson and Wilson, 1937; Tamari, 1942) and for attempts to correlate the site and extent of bone distortion with audiometric findings (Clemis *et al.*, 1967; Henkin *et al.*, 1972). This correlation was inexact but the work of Clemis *et al.* (1967), in particular, established that the hearing loss was greater than could be accounted for by ageing alone and that, in agreement with our findings, it had no hereditary basis or relationship to past or present aural infection.

Whatever the causation Paget's deafness was incurable until the discovery of calcitonin, and we can find no record of improvement with any other agent.

Since most pathological and x-ray studies have been carried out in subjects with gross temporal bone destruction we recognize how valuable temporal bone tomography would have been in our patient, whose skull x-ray picture was apparently normal. We also agree with the suggestion that impedance audiometry should be a standard investigation in Paget's deafness, thereby defining more accurately the role of the stapes in this condition (O'Neill, 1973).

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