SHORT REPORTS

Deafness in Paget's Disease: Effect of Salmon Calcitonin Treatment

Deafness commonly accompanies Paget's disease in the skull. The deafness may be conductive or sensorineural but is usually mixed.¹ Theoretically treatment with calcitonin might be expected to improve hearing as this hormone reduces the raised turnover and vascularity of the diseased bone tissue and may also produce radiological remodeling of the bone.² We investigated this possibility in 10 patients with Paget's disease who were treated with salmon calcitonin for 12 to 62 weeks (mean 41 weeks).

Patients, Methods, and Results

Six of the 10 patients had radiological evidence of Paget's disease in the skull. A full otological and audiometric assessment was performed, and at least four daily urine collections were assayed for total hydroxyproline in each patient before and about every three months during treatment. Salmon calcitonin solution (Calcimar, Armour) 100 M.R.C. units (about 25 µg) was given subcutaneously by self administration daily as a single or divided injection.

The results of treatment are shown in the table. There was no subjective or objective improvement in hearing in any patient.

Discussion

Our failure to find an improvement in hearing contrasts with the findings of Shai *et al.*,³ who reported early improvement in air conduction in three out of six patients with deafness due to Paget's disease. Two of these patients had congestive cardiac failure and calcitonin treatment produced a noticeable diuresis, a feature we did not observe. A rapid improvement also occurred in another patient,⁴ but as the skull radiograph was normal the diagnosis of deafness due to the Paget's disease was questionable.

The lack of improvement in hearing in our patients is disappointing but probably indicates that longer treatment is necessary to induce radiological healing of the disease, which may take many months or even years to become apparent⁵ and was not observed in this study. Treatment was, however, associated with a striking reduction in the turnover of the diseased bone, the mean urinary hydroxyproline level falling 66% (from 2.21 mmol/24 h to 0.74 mmol/24 h (290 to 97 mg/

24 h)). Further loss of hearing may, therefore, have been prevented by treatment. The clinical and biochemical response to treatment was most encouraging and confirms the usefulness of calcitonin in reducing the abnormally raised turnover of bone and the bone pain of Paget's disease.

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¹ Davies, D. G., *Acta Oto-laryngologica*, 1968, Suppl. 242.

² Woodhouse, N. J. Y., *British Journal of Hospital Medicine*, 1974, 2, 677.

³ Shai, F. S., Baker, R. K., and Wallach, S., *Journal of Clinical Investigation*, 1971, 50, 1927.

⁴ Moffat, W. H., Morrow, J. D., and Simpson, N., *British Medical Journal* 1974, 4, 203.

⁵ Doyle, F. H., *et al.*, *British Journal of Radiology*, 1974, 47, 1.

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Myasthenia Syndrome during Penicillamine Treatment

This article reports some observations made in a boy who developed a myasthenic syndrome after treatment with D-penicillamine.

Case Report

This 13-year-old boy was admitted to hospital in March 1972 after his 16-year-old brother had died from Wilson's disease. At that time he felt

Audiometric Assessment and Clinical and Biochemical Observations before and during Salmon Calcitonin Treatment

Case No.	Age and Sex	Radiological Skull Involvement	Deafness			Additional History	Before Calcitonin		On Calcitonin		Length of Treatment (Weeks)	Hearing Change
			Conductive*	Sensori-neural†	Neural‡		Urinary Hydroxyproline (mmol/24 h)	Bone Pain	Urinary Hydroxyproline (mmol/24 h)	Pain Relief		
1	65 M.	+	Left ++	++	0	} Wartime gunner	2.70	++	1.16	+	62	-
2	52 F.	+	Right ++	++	0		3.56	+++	0.95	+	46	-
3	75 M.	+	Left ++	++	0	} Mother deaf with skull Paget's disease, 3 grandchildren have hearing aids	6.82	-	1.28	-	53	-
4	74 F.	+	Right ++	++	0		1.96	-	1.17	-	30	-
5	62 M.	+	Left ++	++	0	} Father had Paget's disease	1.09	+	0.38	+	27	-
6	69 M.	+	Right 0	++	0		2.35	-	1.43	-	12	-
7	54 F.	-	Left 0	++	+	} Wartime gunner	0.86	++	0.28	+	61	-
8	69 M.	-	Right ++	++	0		0.79	+	0.18	+	52	-
9	69 M.	-	Left 0	+	+	} L. head injury from V1 rocket blast, streptomycin deafness 1959, recovered	1.45	+	0.34	+	54	-
10	56 M.	-	Right 0	+	0		0.50	+	0.24	+	39	-

*0 = No air/bone gap. + = Air/bone gap <20 dB (average of readings taken at 500 Hz, 1 kHz, 2 kHz). ++ = Air/bone gap >20 dB (average of readings taken at 500 Hz, 1 kHz, 2 kHz).

†+ = Bone conduction threshold <30 dB at 2 kHz. ++ = Bone conduction threshold >30 dB at 2 kHz.

‡0 = No retrocochlear signs. + = Abnormal tone decay or speech discrimination indicative of neural lesion.

Conversion: SI to Traditional Units—Urinary hydroxyproline: 1 mmol/24 h ≈ 131 mg/24 h.