The arthritis gradually resolved after treatment with bed rest, splintage, and oral diclofenac. A two week course of oral phenoxymethylpenicillin 500 mg four times a day was administered after confirmation of the diagnosis.

Comment

This case of Lyme disease was acquired in the Southampton area of England; Lyme disease presenting as meningitis was recently reported from the same area.[3] The presentation in early summer reflects the seasonal variation of erythema chronicum migrans and the feeding cycle of the tick.[2]

The prominent synovial inflammation in this case is in keeping with the North American pattern of Lyme disease,[1] in contrast with the preponderance of cutaneous and neurological manifestations described in European cases. Differences have been shown between isolates of protein from European and American strains of *B burgdorferi* and may explain this variation in the clinical pattern.[4]

The importance of Lyme disease lies in its high relapse rate and progression, if untreated, to a chronic erosive arthropathy in a tenth of cases.[5] The diagnosis is readily confirmed by serology. Treatment with high doses of penicillin reduces the frequency and severity of recurrence; intra-articular steroids may have deleterious effects in affected joints and should be avoided.[5]

Lyme disease should be considered in any patient presenting with a history of insect bite and a seronegative arthropathy.

We thank Dr D J M Wright, of Charing Cross Hospital, for performing *B burgdorferi* serology.

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Auditory rehabilitation: should we listen to the patient?

Presbyacusis is part of aging: socially important impairment of hearing increases with age so that almost two thirds of people aged over 70 are likely to be affected.[1] Only a minority of people with impaired hearing in Britain seek help, however, most of them from the National Health Service. Some of these patients will receive a hearing aid; 460 000 postaural aids were issued in 1985, at a cost of £14m for the appliances alone. Estimates of the need far exceed demand, which already overstretches present resources.[2] A paradox exists, however, in that up to a fifth of these aids are not used within six months of issue and a further fifth are underused in that time.[3]

Evidently there is a discrepancy between the patient's use of a hearing aid and the doctor's optimism in prescribing it. Audiological and ergonomic reasons for non-use have been well documented, and various rehabilitation procedures designed to overcome these difficulties have been evaluated.[4] In general, however, the results have been disappointing, which has led to speculation that the criteria for issuing hearing aids should be reviewed.[5] To investigate the relation between patients' characteristics (including their attitudes and expectations) and their subsequent use of hearing aids we carried out a prospective study of elderly patients attending one hearing aid centre.

Patients, methods, and results

Before they were issued with a hearing aid 200 elderly patients attending St Helier Hospital's audiology clinic were assessed in terms of their hearing impairment, disability and handicap, attitude towards their forthcoming hearing aid, and expectations of benefit. Six months after the issue of the aid the degree of use and satisfaction were assessed. All assessments were by self completed questionnaires derived from the Medical Research Council's national hearing survey. The results of audiography were recorded as the average loss in the better ear over the range 0·5 to 4 Hz. Because the catchment area of the hearing aid clinic covered three health districts, each with its own rehabilitation service, a "natural experiment" of the effectiveness of different follow up services was conducted.

Association between patient characteristics and outcome of the issue of their hearing aid in 146 patients

	Satisfaction (r)	Frequency of use (r)	No of patients who expected that the hearing aid would help with this activity (%)
Impairment	0·15	0·02	
Disability	0·08	0·08	
Handicap	0·03	0·02	
Initial attitudes	0·19*	0·12	
Prediction of use	0·21*	0·12	
Achievement of expected benefit†			
Telephone	0·48**	0·15	91 (62)
Television	0·62**	0·33**	133 (91)
Radio	0·68**	0·43**	121 (83)
One person	0·70**	0·52**	104 (71)
Group	0·58**	0·14	131 (90)
Type of postaid rehabilitation‡	0·21	0·33*	

r=Spearman's rank correlation coefficient.
* $p<0·05$, ** $p<0·001$.
†Degree of help experienced in an activity in which the individual had expressed difficulty before the issue of the aid and in which he expected the hearing aid to help.
‡Range varied from no active follow up (problem clinic only) to follow up by professional therapists using a regular monitoring system.

A total of 146 (73%) patients completed both questionnaires. Nine patients died during the study period. The mean age of patients was 72, with 60% women. Some 112 (77%) had a hearing loss of 35 db or greater. Ninety seven (66%) thought that the forthcoming hearing aid was a good idea; 42 (29%) were doubtful; and seven (5%) did not want it. Eighty six (59%) expected to use it all the time, 58 (40%) occasionally, and one (1%) not at all. After six months 12 (8%) patients had stopped using the aid completely; 87 (60%) used it occasionally, 31 (21%) often, and 16 (11%) all the time. The average reported daily use was 3·8 hours. Eighteen (12%) patients were not at all satisfied with the hearing aid, 17 (12%) a little satisfied, 61 (42%) moderately satisfied, and 50 (34%) very satisfied. The degree of hearing impairment, disability, and handicap did not correlate with the levels of satisfaction or frequency of use (table); nevertheless, expected benefit was strongly associated with a successful outcome. Comprehensive rehabilitation given after the hearing aid had been supplied was associated with an increase in the frequency of use but not with increased satisfaction. Those patients who had expected to use the aid infrequently were the most satisfied.

Comment

Rather more of our patients had a hearing loss of 35 db or more than the proportion found in an earlier study (77% and 66%, respectively).[1] Our study confirmed the clinical impression that patients have considerable expectations of the benefits to be obtained from a hearing aid. It suggests that a counselling service before these are supplied, exploring individual patients' requirements and identifying realistic expectations, would be more effective in improving a hearing aid service than concentrating solely on a follow up rehabilitation programme. Historically the decision to refer to an ear, nose, and throat surgeon has been based on the degree of impairment and disability the patient experiences. The poor correlation between these variables and the subsequent outcome, together with the considerable overlap in the levels of impairment found in the clinic and general elderly populations,[1] indicate that these criteria are no longer valid for an aging population. Deafness in such people should not be considered an illness. Why should the doctor treat hearing impairment differently from the other common age related sensory deficit, visual impairment? The relationship between the ear, nose, and throat surgeon and the audiologist could be modelled on that of the ophthalmologist and the optician. Referral to an audiology clinic could be initiated by either the patient or the general practitioner and the onus would be on the audiologist to provide assessment, counselling, and a hearing aid if appropriate.

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Erythrocyte zinc in differential diagnosis of hyperthyroidism in pregnancy: a preliminary report

During pregnancy it may be difficult to distinguish between untreated pre-existing thyrotoxicosis and transient hyperthyroidism associated with hyperemesis gravidarum,[1] but such differentiation is necessary for management. Because erythrocyte zinc concentrations are reduced in established thyrotoxicosis[2] we describe here the measurement of erythrocyte zinc concentrations as an aid to differentiating between the two conditions.

Patients, methods, and results

Over five months 14 consecutive patients with hyperemesis gravidarum (mean gestation nine weeks) and 10 controls admitted for termination of pregnancy (mean gestation 9·5 weeks) had their thyroid function and erythrocyte zinc concentration measured. None had a history of thyroid disease. Five patients with clinical features suggesting thyrotoxicosis before pregnancy and without vomiting who presented between nine and 25 weeks' gestation were similarly investigated. On admission total plasma thyroxine and triiodothyronine concentrations were estimated by radioimmunoassay (Diagnostic Products Corp). Erythrocyte zinc concentrations were estimated by atomic absorption spectrophotometry.[2]

Among the controls (group 1) the mean thyroxine concentration was 117·5 (SD 40·5) nmol/l (normal laboratory range 60-140 nmol/l) and the mean triiodothyronine concentration 2·1 (0·8) nmol/l (normal 0·8-2·5 nmol/l). Among the hyperemetic patients seven had normal thyroid values (group 2) and seven had initially raised values which returned to normal within two to five weeks without treatment (group 3). The five patients with pre-existing untreated thyrotoxicosis (group 4) had significantly higher thyroxine (296·2 (55·8) nmol/l, *t* test $p<0·001$) and triiodothyronine (6·8 (2·7) nmol/l, $p<0·01$) concentrations than the controls. They subsequently received antithyroid drug treatment.

The erythrocyte zinc concentrations are shown in the figure. The mean (SD) values in groups 1, 2, and 3 were 196·5 (39·1), 201·8 (25·3), and 219·8 (27·9) μmol/l red blood cells, respectively. The untreated thyrotoxic patients had significantly lower concentrations than the controls (120·6 (14·3) μmol/l red blood cells ($p<0·001$)). The mean differences (with 95% confidence interval) between the values of groups 2, 3, and 4 and the controls were, respectively, 5·3 (−30·7 to 41·3), 23·3 (−13·5 to 60·1), and 75·9 (36·8 to 115) μmol/l red blood cells.

Comment

Vomiting and hyperthyroxinaemia in pregnancy may be common to both pre-existing untreated thyrotoxicosis and hyperemesis gravidarum. Antithyroid treatment is indicated for thyrotoxicosis, which may have serious consequences[3] and may be aggravated in early pregnancy.[4] On the other hand, the value of antithyroid drugs in transient hyperthyroidism is not established,[5] and their use should probably be reserved for patients who relapse or in whom the abnormality persists into the later stages of pregnancy.[1] Differentiating between these two conditions is therefore important.

In established thyrotoxicosis the erythrocyte content of carbonic anhydrase isoenzyme B is reduced. As most of the zinc in erythrocytes is present in association with carbonic anhydrase there is a correspondingly reduced concentration of erythrocyte zinc in hyperthyroid patients.[2] The changes in erythrocyte zinc concentration following changes in thyroid function take time to develop, however, as the zinc concentration in circulating erythrocytes is not affected. Therefore patients with transient hyperthyroidism of pregnancy would be expected to have normal erythrocyte concentrations of zinc.

Seven of our hyperemetic patients had raised concentrations of thyroid hormones together with signs and symptoms of thyrotoxicosis. Their normal erythrocyte zinc concentrations, however, differentiated them from the thyrotoxic patients and suggested that their hyperthyroid state was of recent onset. This suggestion was borne out by subsequent events. Our data suggest that measuring erythrocyte zinc concentrations allows discrimination between pre-existing hyperthyroidism and transient hyperthyroidism of pregnancy. In uncertain cases this may greatly facilitate management.

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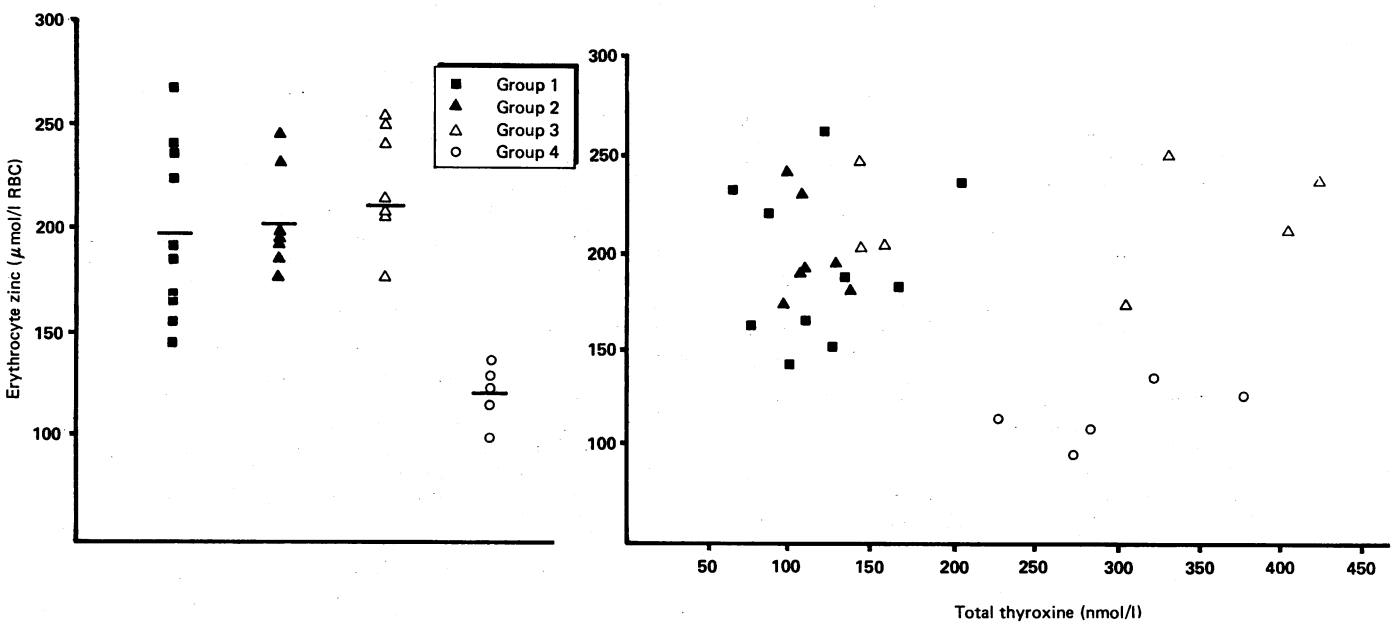

Left: erythrocyte zinc concentration in the four groups of patients. Right: erythrocyte zinc concentrations related to total thyroxine concentration in the four groups of patients.
RBC=Red blood cells.