

PRACTICE OBSERVED

Practice Research

Audit of the use of vitamin B₁₂ in general practice

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Voluntary audit in general practice has been unanimously endorsed by the Royal College of General Practitioners (1977), the General Medical Services Committee (1979), the special conference of local medical committees (1979), and the fourth national trainee conference (1981), and furthermore was recommended by the Royal Commission on the National Health Service: "General practitioners should make local arrangements to facilitate audit of the services they provide." Trainee general practitioners have been advised to "learn to audit" and "develop a healthy, critical appreciation of the clinical and organisational aspects of their training practice."¹

Carrying out a formal audit requires collecting objective evidence of performance that can be compared with agreed standards to identify, implement, and then evaluate appropriate changes in practice.² This paper describes a formal audit carried out in our training practice.³

It has been shown that the observed use of vitamin B₁₂ in general practice in England and Wales greatly exceeds its expected use; and that it is widely prescribed by general practitioners for non-specific indications.⁴ Further evidence suggests the need to rationalise the use of vitamin B₁₂ in general practice.⁵ As this study was part of the trainees' education in methods of audit and research its expected scale provided a reasonable expectation that it could be completed within their training period—an important consideration.⁶

The aims of the study were: (1) to examine the present use of vitamin B₁₂ in our practice, and (2) to achieve a more appropriate and efficient use of it.

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Method

The study was carried out in a Leicester training practice with 12 000 patients. All patients who were receiving B₁₂ injections were identified by asking the doctors and nurses in the practice to record the names of these patients over four months. In addition, our repeat prescription clerk independently compiled a list of all patients requiring prescriptions for vitamin B₁₂ over six months. The type of B₁₂ preparation used, the frequency of injections, and whether the injections were carried out in the surgery or the patient's home were also determined at this stage. If a patient was receiving an injection at home but usually consulted the doctor at the health centre the venue was considered inappropriate.

The medical records (FPS, 6) of all the patients were then reviewed to identify reasons for the use of B₁₂, and the extent to which diagnostic criteria were established and appropriate management and follow-up undertaken. All details were entered in a specially designed proforma for each patient.

The results of the initial data collection were then presented to all the partners at a practice meeting. All the doctors agreed to change to the criteria identified by the authors, the practice nurses were advised accordingly, and a follow-up collection of data was undertaken. In all cases where changes in treatment or management or both were introduced the patients received both written and verbal explanations from the practice doctors or nurses or both.

The Leicestershire vocational training scheme provides a three month introductory period in general practice followed by two years in rotating hospital posts and concludes with nine months in general practice. This study began when the trainees first came to the practice, continued throughout the hospital years, and was completed on their return to practice. There was therefore an interval of almost 18 months between the two data collections.

SETTING STANDARDS

In setting standards we decided that our criteria should be explicit—that is, identified before collecting evidence of performance—and that our criteria should be appropriate for British general practice, safe, realistic, and achievable. In arriving at our criteria we consulted three standard textbooks of medicine (Aithead, Davidson, and Price,⁷ a consultant haematologist, the librarian at the Royal College of General Practitioners, and the Monthly Index of Medical Specialities,

detailed explanations given to the patients, who were also reassured that no recorded instances of relapse had occurred in a two monthly schedule of injections.

We were shocked to find that less than a third of the patients received adequate haematological monitoring and that this figure remained unchanged. On the other hand, a system of regular monitoring of injection frequency was started which allowed defaulters to be rapidly detected, and it is notable that all five new cases received follow up blood counts. Perhaps annual blood counts are unnecessary if patients are known to be receiving regular injections.

By the time of the second survey all patients were receiving Neo-Cytamen, all injections were being given by a nurse, and all injection venues were appropriate.

Conclusion

There is growing evidence that doctors who participate in audit "find the exercise educational, many unexpectedly gaining insight into their own style of medicine."⁸ By collecting objective evidence of our use of vitamin B₁₂, the differences between the medical care that we assumed we were providing and the care that we were actually providing were made obvious. This stimulated changes in doctor behaviour and led to improvements in our standards of clinical practice and patient care. Further-

more, all doctors agreed to follow the criteria identified in our future use of vitamin B₁₂.

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References

- Royal Commission on the National Health Service. *Report*. London: HMSO, 1979.
- Moore J. Trainee research in south-east Scotland. *J R Coll Gen Pract* 1979;29:466-7.
- Fraser RC. Audit at work: the future. *Br Med J* 1981;282:1199-201.
- Cochrane AL, Moore J. Expected and observed values for the prescription of vitamin B₁₂ in England and Wales. *Br J Prev Soc Med* 1971;25:147-51.
- Ellis FR, Nasser S, Wroughton RJ. A survey of the use of vitamin B₁₂ in general practice. *Practitioner* 1970;200:838-42.
- Fraser RC. Audit at work in Lancashire. *Br Med J* 1981;282:1128-30.
- Howe JGR. Managing thyroid illness: a trainee group project. *Br Med J* 1982;285:1541-2.
- Royal College of General Practitioners, Office of Population Censuses and Surveys, Department of Health and Social Security. *Monthly patterns from general practice 1971-72. Second national study. Studies on medical and population subjects*, No 36. London: HMSO, 1979.
- Shaw CD. Audit in British general practice. *Br Med J* 1980;281:1361-3.

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Continuing Education

Building on the training experience

NEWCASTLE BRANCH OF WOMEN IN MEDICINE

One of the most disappointing features of current medical education is that the enthusiasm and initiative of newly trained general practitioners is dissipated when they become principals in practices that do not fulfil the expectations and ideals envisaged during vocational training. We should like to see continuing education of general practitioners that builds on and broadens the training experience. Lectures and published works will have little benefit if they cannot be related to our everyday experience. Our daily contact with patients should be our continuing education and other input should nurture our ability to learn from this. Opportunities to discuss clinical and management problems regularly with other members of the primary health care team are a sound basis from which to build. Unfortunately, there are still few practices in which this happens, and for most of us discussion of the work we do has to be set up artificially.

Doctors in many areas, mostly younger and recently trained doctors, have begun to meet regularly to discuss their work. The success of such discussion groups depends very much on the commitment of the members—their willingness to prepare material and the degree of trust that develops among them to

allow for frank criticism and uninhibited discussion. These groups are attended almost exclusively by doctors. If we are to pay anything other than lip service to the concept of the primary health care team we must seek the participation of all our professional and clerical colleagues, both as members of such groups and as contributors to our mutual education. Our personal experience has been that it is difficult to prevent the group discussions from becoming diffused and anecdotal, lacking clarity of analysis and firm conclusions. Perhaps leadership skills are required that we lack. We should like to see the development of such skills as an important part of continuing education and postgraduate centres or the local faculties of the Royal College of General Practitioners, or both, providing a pool of experienced leaders to help.

Compulsory study

Even if such groups were more successful and became more numerous however, it is unlikely that more than a few general practitioners would participate. To include the majority of general practitioners, continuing education would have to be altered. The possibility of reducing list sizes is currently being discussed. If this was realised it is very likely to lead to greater flexibility of workload and to providing a half day of study a week for each principal. The study afternoon could be an integral part of the terms of service for general practitioners and used to

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The following standards were set:

- Criteria for the use of vitamin B₁₂—(a) Of proved value in the treatment of pernicious anaemia (only other conditions are very rare in British general practice); (b) May be necessary prophylactically after surgery—for example, gastrectomy, resection of terminal ileum.
- Diagnostic criteria for pernicious anaemia: (a) a low serum concentration of vitamin B₁₂ with a normal folate concentration; (b) a macrocytic response to B₁₂ treatment.
- Treatment and management criteria—(a) Hydroxycobalamin (Neo-Cytamen) is superior to cobalamin (Cytamen) as it produces higher blood concentrations and a longer response at a similar unit cost; (b) 100 and 170 µg must be given respectively; (c) The optimum dosage is 1000 µg at intervals of eight weeks; (d) A follow up annual blood count is required to avoid relapse.
- Operational efficiency—(a) A nurse (dietician, attached, or employed by the practice) should give the necessary injections; (b) Injections are to be given in the surgery or health centre if possible.

Results

Thirty five patients were receiving injections of vitamin B₁₂, four of whom were found to be registered with the practice and therefore excluded. Of the remaining 31 patients, 21 were women and all but two were over 65 years. Twenty two patients (71%) were receiving vitamin B₁₂ injections as replacement therapy for pernicious anaemia. The reasons for the use of vitamin B₁₂ in the other patients were: treatment after surgery (5), multiple sclerosis (1), diabetes mellitus (2), no discernible reason (1).

Table I shows the extent to which our diagnostic criteria for pernicious anaemia were satisfied before starting vitamin B₁₂ injections. In only 23% of instances had all three diagnostic criteria for pernicious anaemia been established. In the interval between the first and second data collections five new cases of pernicious anaemia were discovered. In these five cases all three diagnostic criteria were satisfied.

Only nine patients (28%) had had a blood count performed in the previous year, 14 (45%) within two years, and six (20%) had not had a blood count done in the previous five years. On average a blood count had been performed every 4.4 years.

Table II shows the extent to which our agreed criteria for the

remaining items were implemented. In the interval between the two data collections 11 patients died or left the practice, including both patients with diabetes. Vitamin B₁₂ injections had been stopped for the patient with no discernible indications, although the patient with multiple sclerosis continued to have injections as she had become dependent on them.

At the time of the first survey the average number of injections per patient a year was 12.7. By the time of the second survey this figure had almost halved (6.9). In all, 17 patients injection frequency changed between the two surveys. The average consultation rate per patient a year for the three years before the change in injection frequency (5.9) was greater than the average consultation rate in the year after the change (4.6).

Discussion

We make no claim to have identified definitive and immutable criteria for the use of vitamin B₁₂ in general practice. We believe, however, that the standards that we set for ourselves are not only realistic and achievable but also reasonably reflect the current state of knowledge. We could discover no evidence to suggest that vitamin B₁₂ has an effective therapeutic role beyond the correction of a specific or potential vitamin B₁₂ deficiency state. In practical terms in British general practice it is essential to ensure that patients with pernicious anaemia, although in immigrant populations trace vegans might require special scrutiny. It was gratifying, therefore, to find that initially only four patients (12%) out of 31 and latterly one patient (4%) out of 24 were receiving B₁₂ for non-specific reasons compared with a reported national rate of 33%.⁴

Although we are confident of the validity of most of the data presented, we had to depend on the quality of the patients' medical records in checking the criteria used to establish a diagnosis of pernicious anaemia and the frequency of haematological monitoring. The absence of particular items in a patient's record can mean that a procedure was not undertaken or that it was undertaken but no record was made or retained. Furthermore, several patients were already receiving B₁₂ before registering with our practice.

Our first data collection showed three areas of discrepancy between our identified criteria and actual clinical practice: (a) insufficient criteria to establish the diagnosis of pernicious anaemia; (b) too frequent administration of B₁₂; and (c) inadequate haematological monitoring.

It was disappointing to find that our diagnostic criteria were satisfied in only 23% of instances. It is unlikely, however, that we were treating many patients unnecessarily who did not have pernicious anaemia, as the apparent incidence of pernicious anaemia in our practice (1.8 per 1000 patients) is only slightly greater than a nationally reported rate (1.3 per 1000).⁴ This may be attributable to the proportion of patients over 65 years of age in our practice (22%), compared with the national rate (14%). Nevertheless, a major improvement in diagnostic precision was indicated and did occur as appropriate laboratory evidence was obtained for all five new cases of pernicious anaemia.

A substantial and necessary reduction in the high number of injections of B₁₂ administered to the patients was also brought about. The average number of injections per patient a year almost halved (12.7 to 6.9) by greatly increasing the proportion of patients receiving injections at two monthly intervals (13% to 84%). The resulting savings in the cost of drugs, and syringes, for example, are self evident and enabled nursing staff to devote the time saved to more important activities such as routine monitoring of patients' blood pressures.

In changing the frequency of the patients' treatment regimes we were conscious that we were disturbing what for many had become a regular part of their lives, often over many years. We had previously agreed that if any patient showed distress at the prospect their current regimen should be continued. In the event no problems were encountered and no increase in consultation rates ensued. This may have been due to the

attend formal courses, for group work, or for individual study, depending on personal preference. Such a system raises the question of compulsion. It does not seem unreasonable that people in such responsible work based on such a huge and ever growing body of knowledge should safeguard their patients' interests by undertaking regular study. Certainly the concept of compulsory courses is not foreign to other health professionals. We accept compulsory education from the time of entering medical school until finishing vocational training—why not for good? It would help to improve and maintain standards and interest in general practice. Possibly more of a problem than the concept of a compulsory study afternoon is the assessment of the content of that study. Should there be certain essential subjects that must be updated regularly? Or should there be some form of continuing assessment? Is group work now an essential tool for general practitioner training or may the same goals be achieved in individual study? Obviously, the aim of continuing education should not be to produce uniform general practitioners. One hopes that our individuality and diversity is not so fragile that they will be squashed by a little exposure to the ideas of other doctors.

If one accepts the necessity of regular study the next problem is how to organise it. We would like to see this become a task of the local postgraduate centres. They would need to be developed rather differently than at present. The general practitioner organiser would have a part time salaried post rather than an additional commitment to full time practice. Part of his or her job would be to organise work programmes for individual doctors according to their needs and to set up and monitor small groups. Course material, tape-slide presentations, and video recordings, for instance, would be provided by the centre. More formal courses such as the Open University therapeutic course, which one may work through systematically either in a group or alone, would also be available. Day and weekend courses of the kind already provided should also be organised by the general practitioner tutor, and if lists are smaller and the work more flexible it should be easier for doctors to attend these. We hope that we will not always need to remind men colleagues of the importance of providing crèches at such meetings to enable doctors with domestic commitments to attend.

Meeting consultants

A separate function of the postgraduate centre is to encourage communication among local hospitals, consultants, and general practitioners. All recently trained general practitioners will be familiar with the misconception of the nature of general practice commonly held by some hospital doctors. Two way

communication about both individual patients and topics of mutual interest would do much to break down these barriers. Many postgraduate luncheon meetings now follow the traditional pattern used from medical school onwards of a consultant colleague delivering a lecture on his favourite topic to a large audience of general practitioners and junior hospital doctors, many of whom have come for the free food rather than from any interest in the subject. The atmosphere is generally inhibiting and some general practitioners may feel timid about asking questions. There is no opportunity to get to know the consultants individually, which would surely be one of the functions of such a meeting. A more constructive approach, we think, would be for consultants to go to a practice or a small group of practices in the area and discuss topics of mutual interest. Individual practices have taken the initiative and arranged such meetings themselves, which are certainly extremely helpful in enabling new members of the team to become acquainted with the local consultants. It should be a specific job of the general practitioner organiser to liaise with consultants and organise such meetings. Large luncheon meetings have their place, but we think that they are more successful when there is a joint presentation between a consultant and a general practitioner, using clinical cases and that there should be a far greater input from general practitioners in the selection of topics and presentation.

Although continuing education on these lines might be welcomed by recently trained general practitioners, who are accustomed to analysing their work in a group, for most older doctors such an approach is very threatening. We need to find new ways of introducing established general practitioners who have no experience of discussing their work with colleagues to this kind of assessment. One way may be to encourage doctors to look at how their own practices are run—for example, by the introduction of a repeat prescribing system, or screening methods, which might by their nature require partners to discuss their methods of working. The general practitioner organiser from the postgraduate centre would help to set up such schemes and provide information and advice. Installing a computer in a practice could lead to a fundamental reassessment of the way the practice works. Further encouragement could come from family practitioner committees giving financial help to establish practice libraries, seminar rooms, and video recorders.

We would like to see these ideas put into practice in the future, but we realise that unless doctors actually want to improve their own standards no amount of input will fundamentally alter the delivery of care in general practice. Most doctors enter general practice with a desire to do their job well and maintain the standards they acquired during training. We would hope that the main aim of continuing education is to support this enthusiasm and develop it to its potential.

Diary of Urban Marks: 1880-1948

With Tim Foreman as a guide I saw everything in and around Singapore. He took me to the English Club, and when I remarked on the amount of whisky the younger men could make disappear in a short time he said that I ought to see the cemetery. Most of the drinkers were remittance men—men who were paid by their families to remain out there. The average age on the tombs was 27, and to wonder: The glasses were very heavy, double the size of an ordinary tumbler. There was no duty on whisky out there and a "whisky singa" consisted of more than half an ordinary tumbler of whisky diluted with soda water; several of these were drunk by the younger men in about an hour and a half. Business finishes at 4 pm in Singapore and all the English go to the club for tennis and drinks. Distress takes place suddenly and there is no twilight, Singapore being on the Equator. There everyone goes home to dinner or to the Raffles Hotel, the premier home there. "Chits" are given and signed, the accounts being rendered weekly. This is because native labour is

employed and natives are not allowed to touch the money. If they did the proprietors of the various establishments would never receive any.

From Singapore we proceeded to Kobe in Japan via Nagasaki. Thence we sailed for Yokohama where we anchored for 10 days while the ship was cleaned and reloading. We never put into docks except at Singapore but anchored outside to save the dock dues. When we reached Yokohama we were met by a boatman, came along and asked me if I were going ashore. It was raining in torrents at the time but my progress was of no avail. He was very eager to visit certain (tea) shops some four or five miles out. So we put in a sampan and were rowed three miles to the shore. Then we proceeded to the other side of Yokohama Park watching a game of baseball taking place there. We enjoyed ourselves with the game and at night went to a place of entertainment. We could not understand a word, but the marvellous mimicry of the actors was sufficient to understand the story of the play.

*Nineteen remaining from first survey—five new patients.