A method of evaluating treatment in general practice

ROBERT JOHNSON, M.A., M.R.C.G.P., M.R.C. Psych., D.P.M.
General practitioner, Oldham

SUMMARY. Problems of evaluating health care arise partly from the amorphous nature of health itself. Using a method which allows a wide range of clinical information to be analysed in fine detail, the relative efficacy of antibiotics in the treatment of cough is explored, as well as some benzodiazepines, in the treatment of anxiety.

Results are presented in terms of percentages of patients whose target symptoms were treated with the drug stated, and who returned or whose symptoms returned after an interval of time. The breadth of the system allows other paramedical factors to be evaluated in the increasingly important impact that the wider social malaise has on medical practice.

Introduction

It is becoming clear, from a wide range of comment on contemporary medical practice that medical intervention should not only ameliorate health, but also demonstrate it has done so. Health care must be provided *and* evaluated.

In the United States, the most insistent demands for this, are political in origin. What has been described as the " emerging political craving for quality assessment " (Kessner, Kalk and Singer, 1973) has already found its way onto the Congressional Record (Brook, 1973) and seems unlikely to fade away. Doll (1973) comments on the lesser echoes of a similar process in the National Health Service (Blanpain, 1973; Brook, Berg and Schechter, 1973; Cochrane, 1972; Cornillot, 1973; Forsyth, 1973; Honigsbaum, 1973; Johnson, 1972a and 1972b; Kessner, Kalk and Singer, 1973; *The Lancet*, 1973; Williamson, 1971).

In this country however, the need for evaluation of medical practice is more often based on clinical grounds. Cochrane (1972) gave perhaps the most astringent account, but *The Lancet* (1972) called for more detailed clinical analysis, especially to improve the quality of general practice. And Doll reiterates the point that mortality statistics are too imprecise to give a clear picture of current morbidity.

The chief difficulty in evaluating medical procedures lies in defining the word health. Bradford Hill is reported (Doll, 1973) to have grouped health with other amorphous human attributes such as beauty, love, and happiness, which despite their vital importance have successfully defied definition for several millenia.

This study is based on the supposition that the highly varied nature of clinical work is a fundamental and integral part of medical practice. Accordingly provision was made for the inclusion of as wide a range of detail as possible. This contrasts with the approach of Williamson (1971), Kessner (1973) and others who advocate deliberate previous prior selection criteria, which necessarily excluded the remainder.

This paper illustrates the type of analysis that becomes available with this approach. In particular, with such fine detail recorded in an analysable format, individual transactions in the whole complex of general practice can be examined with precision. This new perspective has many implications.

Journal of the Royal College of General Practitioners, 1974, 832–836.

The detailed analysis entailed by this approach required that every item of clinical significance, including individual symptoms, signs, diagnoses and treatments, be recorded in a specially designed format. I have described this elsewhere (Johnson, 1971, 1972, a, b, c, and d). Recent developments using a mini TV screen allow doctors (or receptionists) with no previous knowledge of it to use the system freely, while at the same time curtailing transcription errors.

Method

On *prima facie* grounds, the ideal treatment should abolish a given symptom permanently, or at least reduce its frequency. In general it should also reduce the rate of attendance of the individual receiving it, and should produce the comment " better " or " very much better " at the next attendance.

Results

The efficacy of various antibiotics in the treatment of cough was analysed. Cough had been found in my earlier study (Johnson, 1972a) to be the second most frequent single symptom. Results are expressed in terms of percentages of patients whose symptom was treated with the drug stated.

In figure 1, the relative delay in the recurrence of the target symptom is shown by comparing the effect of penicillin-V and ampicillin, in patients under 15 years of age.

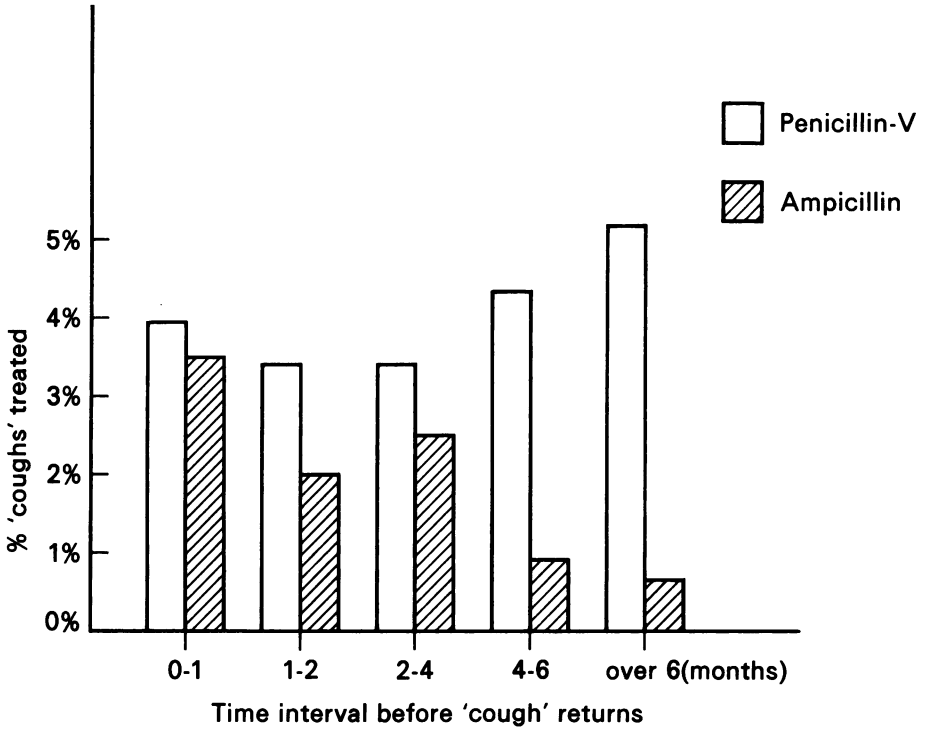

Figure 1
Comparative efficacy of penicillin-V and ampicillin in delaying the recurrence of a cough, in patients under 15 years of age

A decrease in the frequency of attendance of patients with a given symptom treated with a particular drug, provides a less specific measure of efficacy. Figure 2 shows comparative results for oxytetracycline and ampicillin in those 15 years and older, who presented initially with a cough.

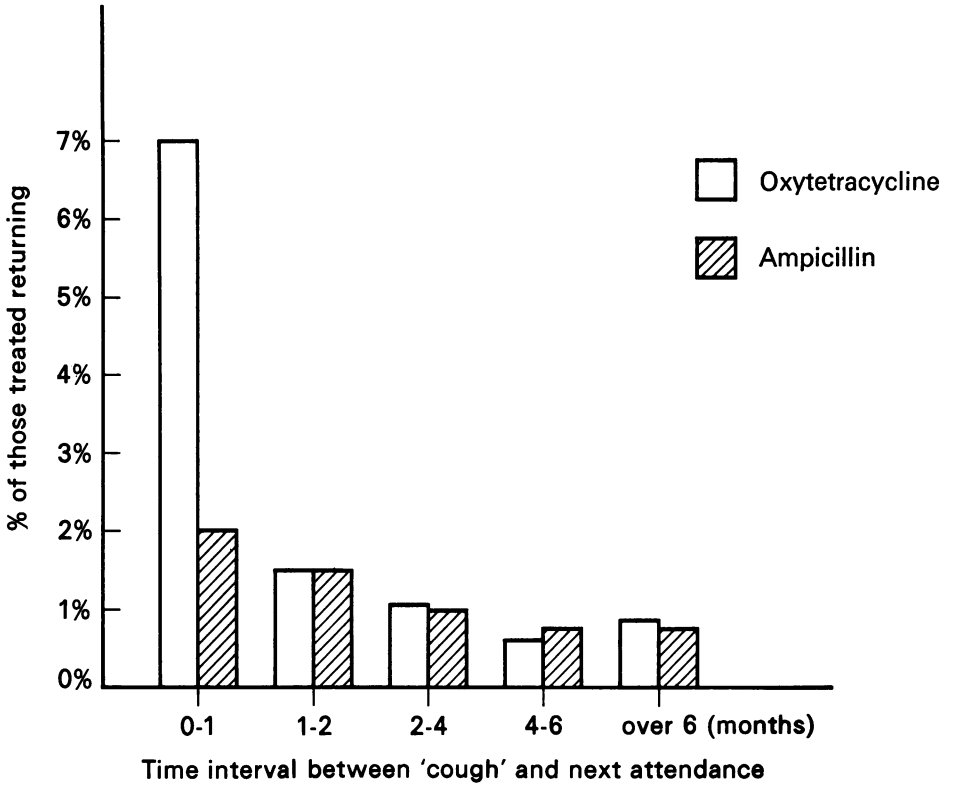

Figure 2
Comparative efficacy of oxytetracycline and ampicillin in reducing the frequency of attendance after treatment of cough (patients 15 years and older)

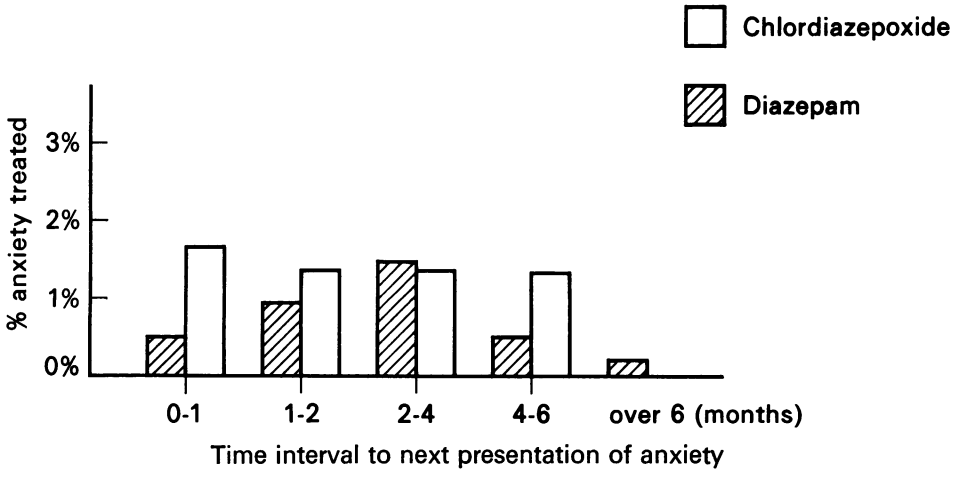

Figure 3
Comparative efficacy of diazepam and chlordiazepoxide and others, in delaying the recurrence of anxiety

Seven per cent of those whose cough was treated with oxytetracycline returned for their next attendance within one month. Of these, roughly 20 per cent were 65 years or older, and the remainder equally divided between 15–44 years, and 45–64 years of age. (Age groups follow those recommended by the World Health Organisation, 1967). Sixty eight per cent were women.

The range of analysis available is wide. Figure 3 for example, shows comparable results in the treatment of ' anxiety ' by diazepam (Valium), and a group of other tranquillisers, predominantly chordiazepoxide (Librium). The graph shows the relative efficacy in delaying the return of the target symptom.

The results from the analysis of the reported change at the next attendance were too few to warrant more than a mention. In the case of ' cough ' treated with oxytetracycline for example, out of 720 instances (15 years and older): five reported themselves " better," six " a bit better," and one " no different." Comparable figures for those treated with ampicillin (also 15 years and older) were: 402 treated, five " better," four " a bit better," six " the same," and one (a woman over 65) " worse ". In the analysis of anxiety, of 554 treated with diazepam, one reported himself " a bit better," whereas out of 362 treated with chlordiazepoxide and others, one described himself as " better." None was recorded as " very much better."

The total numbers are necessarily small, since they arise from the analysis of records made during 12 months single-handed practice, from 1,742 patients attending 10,000 times from a list of about 2,000. Larger series, using the mechanical system would produce results with greater applicability.

Discussion

These results shed light on an unusual aspect of medical practice. The actual impact of a given treatment on any particular symptom, sign, or diagnosis can be analysed with equal precision. The results so far are largely experimental. However, it will shortly be possible, technical factors permitting, to analyse five years of general-practice records, amounting to about 150,000 symptoms and half that number of individual treatments.

Moreover, similar information from another practice or range of practices, could provide fascinating correlations. From figure 1, it appears that penicillin-V is almost nine times more effective than ampicillin (in patients under 15) in delaying the recurrence of " cough " beyond 6 months. Similarly, from figure 2, it seems that ampicillin was 3½ times more effective in delaying the return of a patient (15 years and older) before one month, than is oxytetracycline. If similar patterns were found in other practices, definitive conclusions could be drawn.

Meanwhile, one may only speculate. The anomaly between penicillin-V and ampicillin, for example, may be explicable on the grounds that the latter is reserved for the more serious case. Analysis of the frequency with which the patient or parent attended, the duration of the symptom at the time of presentation, the presence of parental anxiety: all these have been recorded, and could be analysed to substantiate or refute this conclusion.

One may also hazard a guess that there are reasons other than medical urgency that lead to the prescription of oxytetracycline, to the seven per cent who returned within one month (compared with only two per cent of those treated with ampicillin). If such a finding were upheld, it might be necessary to label certain individuals or families as prone to elicit excess antibiotics, so that the doctor and patient could adjust themselves accordingly.

But before reaching this kind of conclusion, it would be necessary to analyse the records more closely, to determine for example, whether the 68 per cent of women attended by themselves, or in the company of their offspring. Again the duration of the

symptom would give a guage as to the severity of the complaint. These factors too, could be culled from the record. As before, comparison of similar age-sex groups from dissimilar practices would prove most stimulating, and could lead naturally to an improvement in practice technique, monitored by further analysis along these lines.

The method provides a means of evaluating the relative efficacy of individual treatments, by analysing precisely what the outcome was reported to have been. Use of further mechanical developments would allow patients to include their own comments on how effective the treatment was, and this could be added to the analysable record, without taking up any of the doctor's time.

In the hospital context, the patient's clinical response to a given treatment is traditionally given more importance than his opinion of it. In general practice, the latter is inescapable. Moreover the importance of social factors, both in the cause of morbidity, and in the acceptance of novel medical techniques is becoming increasingly important, as Doll (1973) makes clear.

Forsyth (1973) goes so far as to regard the absence of medical influence on local authority housing as hazardous. And there can be no doubting the influence on the community's health of the wider social malaise in the modern world, so succinctly reviewed by Knowles (1973).

Only precise analysis of the morbidity that the general practitioner sees can allow each of these many factors to be detached from its element of intuition, weighed, and implemented in a practical, economic programme of health care, subject to continuing evaluation and improvement.

Acknowledgments

I am grateful to Drs E. Powner, and D. Clarke and Mr T. Sharpe of Manchester University for their continued help and encouragement. I am indebted to Mr Peter Best of the same University for his invaluable assistance with the analysis, for which he gave generously of his time and patience.

REFERENCES

Blanpain, J. E. (1973). *Lancet*, **2**, Supplement 4–5.
Brook, R. H., Berg, M. H. & Schechter, P. A. (1973). *Annals of Internal Medicine*, **78**, 333–339.
Cochrane, A. L. (1972). *Effectiveness and efficiency*. London: Nuffield Provincial Hospitals Trust.
Cornillot, P. & Bonamour, P. (1973). *Lancet*, **2**, Supplement 5–7.
Doll, R. (1973). *Proceedings of the Royal Society of Medicine*, **66**, 729–740.
Forsyth, G. (1973). *Lancet*, **2**, Supplement 1–3.
Honigsbaum, F. (1972). *Journal of the Royal College of General Practitioners*, **22**, 429–451.
Johnson, R. A. (1971). *The Medol Handbook*, 16c Clough Lane, Grasscroft, Oldham, OL4 4EW.
Johnson, R. A. (1972a). *Journal of the Royal College of General Practitioners*, **22**, 655–660.
Johnson, R. A. (1972b). *Lancet*, **2**, 535.
Johnson, R. A. (1972c). *Symposium on Community Health Information Systems*. Oxford (in press).
Johnson, R. A. (1972d). *A new Medical Computing Language "Medol"* (unpublished).
Kessner, D. M., Kalk, C. E. & Singer, J. (1973). *New England Journal of Medicine*, **288**, 189–194.
Knowles, J. H. (1973). *Lancet*, **2**, Supplement 19–20.
The Lancet (1972). **2**, 411–412.
Williamson, J. W. (1971). *Journal of the American Medical Association*, **218**, 564–569.
World Health Organisation (1967). *Manual of the International Statistical classification of Diseases, Injuries and Causes of Death*. Geneva: W.H.O. P. 471, (6, b, iii).