PRACTICE OBSERVED

Research in General Practice

Drug monitoring in general practice

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Should general practice research be done by the general practitioner? Most of the time, yes. But occasionally there is a need for an outsider to conduct research that involves many practices. This project on drug monitoring is an example of general practice research done from the outside.

Why I started

The study grew out of a conversation at a cocktail party between an Oxford general practitioner, Dr Peter Pritchard, and my former chief, Sir Richard Doll. Pritchard described a system he had developed for recording prescriptions dispensed in his practice; he was sure that other general practitioners would be willing to participate in research on medicines. Doll was one of several people who had recognised that the best hope of discovering certain kinds of drug hazard lay in record linkage (bringing together different records about a single person).[1-3] The obvious place for a monitoring scheme was in general practice, where most drugs are prescribed. But could record linkage be used to monitor adverse effects of drugs in general practice?

The only way to answer this question was to carry out a feasibility study. The idea was appealing, and I decided to take it on.

What I did

After doing a lot of background reading I discussed my plans with local general practitioners and with experts in drug monitoring in many parts of Britain. This was not merely the excuse for a New Zealander to see the land of his fathers: I received invaluable tips and warnings.

One point became brutally clear. A full-scale drug monitoring scheme would need to cover a large number of general practices for a long time. No matter how worthwhile the general practitioners considered it, therefore, the whole scheme would fail unless there was only a minimum of extra work for them to do.

The approach I chose has been described in detail elsewhere.[4] Briefly, it was to collect prescriptions from the pricing bureau and to link the information with records of hospital admissions, obstetric deliveries, and deaths (in or out of hospital). Few prescriptions carry enough personal data for accurate record linkage. This problem could be solved, however, by comparing the information on each prescription with a list of the identifying particulars of the people in the relevant general practice. Once the various records about each person had been linked together computer analyses could be performed to show associations between drugs and diagnoses. If a drug caused a certain condition the hazard should be detected automatically.

After writing to local doctors I called on those who were interested and eventually invited 20 general practitioners to take part. All that remained was to obtain a research grant and appoint supporting staff.

What I found

The first discovery was that general practitioners write enormous numbers of prescriptions. The pricing bureau sent us a parcel of 14 000 prescriptions each month; these were coded and added to the patients' computer records. In the first year of the study 60% of the population were given medicines, and 21% of all women received a psychotropic drug.[4]

On linking the drugs with hospital diagnoses I found that the system did show associations between drugs and diagnoses (apart from the conditions for which they are prescribed). Some of these were known adverse effects, such as gastrointestinal complaints in patients taking digoxin.[4]

The high prescribing of psychotropic drugs made me begin to worry about other drivers on the road. A special analysis confirmed that people given minor tranquillisers had an increased risk of serious road accidents.[5] Another special inquiry, based on general practitioners' case-notes, showed that patients given practolol had a much higher frequency of minor eye complaints and rashes than had been realised.[7]

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The problems I experienced

Everything would have been impossible if I had not been authorised to obtain the prescriptions from the pricing bureau. This required long and frustrating negotiations, in which I was shunted from official to official. Once the prescriptions started coming we had great difficulty in keeping up with the coding. Part of the answer was to monitor the productivity of staff, but we also had to stop coding details of dosage.

There was a long delay before the records of hospital admissions became available. The people concerned in a study like to see results coming out quickly, so I had to find ways of maintaining the interest of participating doctors. One measure was to give them feedback about their prescribing (see below). We also held project meetings at which progress reports were given. I would never have embarked on the study of practolol if I had not needed something to talk about at one of these meetings. On the face of it, the number of patients who had taken practolol seemed too small for a worthwhile study, but this proved not to be the case because of the unexpectedly high incidence of symptoms.

Doctors are understandably wary about doing research that requires storing medical data on computers. We took great care to safeguard confidentiality. Once the details of the study had been explained, only one consultant withheld permission for me to receive the records of hospital admissions. Eventually he agreed to release them after inspecting each record.

The conclusions I was able to draw

The study showed that record linkage would be a valuable method of monitoring drugs prescribed in general practice. It would reveal unsuspected hazards of drugs, as well as provide more information about adverse effects discovered elsewhere. A full-scale project would be particularly valuable for detecting delayed effects—such as the induction of cancer—sudden deaths outside hospital, and effects on the fetus, all of which are difficult to study by other means.

Apart from revealing the hazards of some medicines, a record linkage scheme would provide positive evidence for the safety of many others. Moreover, it might lead to the discovery of unexpected benefits of drugs.

The lessons I learnt

The first lesson that I learnt was that research in general practice is fun. I enjoyed visiting the different practices, got to know the staff, and was always made welcome. Members of the Oxford Community Health Project gave me valuable advice about data-processing. I was surprised at the amount of time needed to sort out the day-to-day problems that arise in a study involving many people and large amounts of data. Once the project was doing well several people tried to persuade me to incorporate their pet schemes in it. If I had not been stubborn the whole study might have collapsed.

As I had been warned, even highly motivated general practitioners find it hard to keep up special collections of data. As a check on the method of obtaining prescriptions from the pricing bureau, we asked general practitioners to make carbon copies of all their prescriptions during sample periods. Despite the fact that some prescriptions are never taken to the chemist, we received a slightly higher number of prescriptions from the pricing bureau than from the practices during these periods.

When possible it is preferable to spare the doctors from special recording and use data that are being collected routinely for other purposes. Nevertheless, I now know that external bodies are often overoptimistic about when they can provide routine data. This project took far longer to complete than I had expected.

The most important lesson was the value of giving feedback to participants. During the second year we offered general practitioners feedback about their prescribing. Most were fascinated—and surprised—by this information. Some doctors asked for special tabulations, which they used in clinical audit or research. We held project meetings at which general practitioners discussed their prescribing habits, sometimes with a clinical pharmacologist present. Practice A did not believe in cough mixture and hardly ever prescribed it; the four doctors in practice B prescribed over 100 gallons of Phensedyl (codeine, ephedrine, and promethazine) cough linctus in one year. Vigorous discussion of such differences forced general practitioners to examine their prescribing critically; it also maintained interest in the study. If I were to repeat this project, I would give greater attention to feedback.

Advice for others undertaking such research

Firstly, plan carefully. Resist the pressure to start at once: you need time to read the literature and seek advice. Do not finalise your plans until you have discussed them with the general practitioners who may participate.

Try to keep the methods simple. General practitioners are busy people, and the success of the scheme may be inversely proportional to the amount of extra work it gives them.

Once you have decided on the best plan, stick to it. This certainly does not mean closing your eyes to possible extensions or improvements, but the data must be collected in a consistent fashion.

Select your participants carefully, and remember the importance of regular feedback.

If your study requires collecting large amounts of data seek professional advice on coding, data preparation, and so on. Take particular care to safeguard confidentiality.

Finally, do not take research on unless you have time to do it properly. A study like this succeeds only when someone tends it with loving care.

Present opportunities for similar research

If the approach that I have described were used in a much larger number of practices Britain could have a unique resource for monitoring the effects of drugs.[4] The project need not add to the work of general practitioners. Opportunities would be best in places where general practitioners' lists are routinely held on computer, as in parts of Scotland.

Studies of this kind are impossible in a country like New Zealand, where patients are not registered with a general practitioner. The ability to define a population using practice registers makes British general practice a gold-mine for epidemiological research.

References

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The GP and the Specialist

Ophthalmology

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It is doubtful whether there is any specialty whose personnel are sufficiently lacking in machismo to admit that its nature and its problems are adequately understood by general practitioners, let alone by those of any other discipline. All feel misunderstood by others and make claims that are perhaps unjustly labelled "special pleading." None the less, there are good grounds for believing that ophthalmology is a genuine special case and that, with dermatology and psychiatry, it is seriously and even dangerously misunderstood. The relative lack of undergraduate experience—let alone education—in ophthalmology, with some notable exceptions, is one indication. Another is the indisputable fact that most doctors who would be unwilling to admit to basic lacunae in their knowledge of matters of, say, the chest, the stomach, or the bones freely confess their ignorance, and even fear, of the mysteries of the eye.

The subject of ophthalmology is immensely wide. It is not merely concerned with the 1 in diameter receiver of light which is the eye (and, incidentally, also a potent transmitter in terms of interpersonal relations), but its ramifications and relations extend to all other systems. This is also true of other specialised subjects, but ophthalmology is concerned not only with primary care and the general practitioner, hospital care and the appropriate specialist, but has important and major connotations for the essentially normal person and hence for the community.

Refraction

One element of this involvement lies in the physical field that we know as refraction, or optics. This again compounds the mystery of the subject for the person who is not an ophthalmologist, whether medical or otherwise, because of the association with mysterious formulae with + and − and degree signs. If there is any truth in the concept that the medical man is not normally numerically literate it is possible that the appearance of a spectacle formula on the case record may elicit a powerful switching-off reflex.

Ophthalmology has retained rather more of the bastardised Greco-Latin terminology which, even if it has not been abandoned by other specialties, has at least become mind-accustomed from usage. In a subject where "dacryo," "blephar," and "lacrimal" may all relate to tears and eyelids, or where "corneal" and "kerato" are interchangeable, one should not be surprised that to another medical mind "iridocyclitis" may convey the image of a circus act rather than that of an identifiable and comprehensible disease concept. Those who wish to gain a working insight into the specialty would do well to seek a simple mastery of the anatomy and its nomenclature, rather as when embracing Arabic or Greek for the first time with this it is remarkable how rapidly the complexities melt away, but for the medically literate there should be no problems understanding the eye and its processes. It is not a delicate structure pace the common view, certainly no more delicate than any other tissue.

Given the specialised needs of some of its tissues, the eye—which to vision is little more than the aerial is to the television set—functions in accord with the same rules as other systems and organs. Many of its basic activities are mediated by permeability relationships that are the common language of the cell. In the signs and symptoms of conjunctivitis one has a classic illustration of the processes of inflammation, with the calor, rubor, tumor, and color of the red discharging eye.

The need to maintain transparency in the cornea and lens, as well as the intraocular media, is an example of how the relative dehydration of these tissues by osmotic membranes maintains their clarity. When interfered with, as for example by trauma to the cornea, the sequelae lead to what we call a corneal ulcer—not necessarily in any way infective in origin, but often merely a vital example of the processes of the inflammatory response when blood vessels are absent. Even small lenticular capsular osmotic metabolic changes may lead to a gradual degradation of the proteins in the lens capsular bag. The resulting change in the osmotic molecular quantities will lead to the gradual inflow of fluid and development of that opacity, which in its various phases we call cataract.

Sir Henry Dale pointed out the unique advantages of transparent windows of the eye for understanding the natural processes of physiology. It is even more a parade ground of the validity of pathological concepts, illustrating their dynamic character. In chronic conjunctivitis or disease of the lacrimal passage the development of pathological vicious circles may result in the prolongation of a disease condition that is eventually divorced from the original stimulating or aetiological event.

Over and above this panorama of the fundamentals of medical science lies the umbrella of refraction and optics. Associated with geometrical diagrams and mathematical formulae these may repel readers of even this short exposition. Yet, essentially, the subject is simple in terms of the basic physics that all doctors and scientists master in their school years.

Eyes, as one of the special senses, are merely gatherers and measurers of energy on our environment. They "run on light," and their role is to assess and quantify the nature and quality of that form of energy in the individual's surroundings. To this end, light needs to be focused to form retinal images, and in the ideal eye, which is known as emmetropic, this will be achieved for both near and distance by the combination of its basic optical properties with the focusing power of the lens.

But eyes vary in shape and size just as do all other organs. Some will be larger than average, with the consequence that only light from nearer objects can be focused—myopia. Similarly, eyes smaller than average can only see near or distance objects clearly after adjustment by the internal lens. Such are long-sighted or hypermetropic. Add to this the fact that the eyeball is not a rigid object and may present differing curvatures to incident light and we have the situation where no point focus is achievable,

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astigmatism—not a disease but merely the natural and, in some degree, universal consequence of the inherent nature of the globe. Aging tissues tend to lose their elasticity, thereby diminishing the focusing power whatever the underlying basic refraction. With this presbyopia and its effect leading to the need for near vision lenses, we have the whole of refraction in a nutshell.

Examination of the eye

The fundamentals of anatomy allied to those of physiology form the substrate of pathological understanding. Applying this to the problem of ocular symptoms and signs should deviate in no way from that which may be appropriately applied to any other system of organ. But, as with all medical practice, salvation lies not only with history but with adequate and appropriate examination.

For many the path to understanding may be barred by a feeling that it is necessary to be an ophthalmologist to understand ocular disease. Yet what would be thought of the doctor or medical ancillary who admitted to an inability to take a pulse, record a respiration rate, or examine a urine sample? The ocular analogues are the measurement of visual acuity for near and distance; the confrontation assessment of the visual field; inspection of the pupil reactions and the eliciting of ocular movements subserved by the six extra-ocular muscles in each eye, affection of which at either muscular or neural level are likely, in the adult, to be associated with the symptoms of double vision.

To this repertoire, which requires only the simplest equipment, must be added that other foundation stone of clinical practice, adequate inspection in proper conditions of the various tissues. Examination of the eye and its associated structures under ill-adjusted general and distant lighting perhaps accounts for more failed and misdiagnosis than any other single cause. It cannot be too strongly emphasised that the only useful way to examine these structures is with a focused beam of light, applied in a scanning manner, and where appropriate assisted by a magnification such as a watchmaker's glass or loupe. These will yield large dividends, but if the refinement of lying the patient down and examining the eyes from over the top of the head is added, thus facilitating control of the eyelids, it can be seen that the usual approach of the uninformed and amateur can best be compared to Dr Johnson's views on the dog standing on its hind legs or a woman making a speech.

It will be noted that as yet the pons asinorum of so many doctors, the ophthalmoscope, has been conspicuous by its absence. As with all other skills, whether holding the golf club or playing the piano, a basic facility has first to be acquired. But those who are worth their salt will not remain content with the elementary, and it is perhaps through the ophthalmoscope that the indivisibility of ophthalmology with the rest of medicine most clearly becomes apparent. The failures that so many experience in this art arise from such simple and even foolish omissions. Often the instrument is dirty, with fading batteries, while the position of examiner and patient resembles some new variant of the *Kama Sutra*.

Yet boiled down to its essence ophthalmoscopy consists of projecting a light into the eye and arranging to inspect the illuminated interior surfaces and media through the eyes' own optics. As with external examination this requires an appropriate and comfortable positioning of the subject and observer, organised so that the subject is able to look past the observer's head, eliminating the oculospastic effect of the observer's hair and the too often heard scenario of the patient with roving eyes being cajoled (and worse) to "Keep your eyes still." Add to these the fact that four small apertures (the two pupils and the instrument's own apertures) have to be kept in line for anything to be visible, and it will be clear that it is a wonder that the fundus reflex is ever visualised.

Some truths

From emphasis on the simplicity and yet necessity of basic technique we may move to some final considerations. Responsibility for many of the deficiencies noted can be squarely laid at the door of ophthalmologists. How often do they, when asked to speak to those outside the specialty, give that universal talk on "The Red Eye"—so self-evident and obvious, perhaps, when based on classic cases, yet so complex to the skilled and experienced when met in the cold light of everyday reality. It is even more obscure to those with dim and uncertain knowledge of structure and function.

Finally, there are some things that everyone knows about eyes and vision and yet that just simply are not so. As Sherrington taught, vision being one of the special senses is "unfatigueable." The eyes cannot be damaged by use even when diseased or injured. Headache in the absence of overt and obvious ocular involvement is rarely ocular in origin, and pain behind the eyes even less so. Dizziness and vertigo, unless associated with double vision, are unlikely to be ocular in basis, and as one of our crustier forebears once commented, "Everyone has spots in front of their eyes but only bloody fools look at them." Children do not grow out of squints, spectacles do not weaken eyes, and stronger lenses are no more appropriate for a given refraction than larger shoes would to a given foot. Topical steroids should never be used ad hoc, whether they "whiten the eye" or not. These and other aphorisms, of course, have their exceptions, but illustrate what once again must be the only true approach to those who find themselves baffled and even frightened. Salvation in medicine, regardless of specialty, lies in a knowledge and understanding of structure allied to function, founded on appropriate history-taking and clinical examination using simple equipment. With these to guide, the path to enlightenment is sure and certain.

The rewards in the field of ophthalmology are so exciting and stimulating that its practitioners find it sad they are shared by all too few. May these simple thoughts increase their number.

QUACKS AND QUACKERY But what is understood by quacks and quackery? A quack is a person who pretends to knowledge which he does not possess, who promises to do what he is either not sure he can perform, or what he is certain he cannot perform, who represents his practice to be more successful than that of other men, who pretends to cure diseases known and admitted to be incurable, whose manner is confident and imposing, whose tone and language are unhesitating and boastful, who employs remedies, the nature and composition of which he keeps unknown, and who deals in specifics and universal remedies. He is also addicted to handbills, newspapers, and similar modes of making known his pretensions and proceedings. This is the quack; and the conduct of this man is quackery. We have now to ask the apothecaries and the general practitioners the question, are this character and conduct never found except without the pale of the profession? Are there none among the regularly licensed practitioners who act in the manner above designated? (*Edinburgh Medical and Surgical Journal* 1845;**63**:176.)

PRETENDERS TO PHYSIC AND SURGERY Near Kingswood, Gloucestershire, I was not a little amused with a sign embellished with a pestle and mortar on which were the following words: "I Popjay Surgeon Apotecary and Midwife &c. draws teeth and bleeds on the lowest terms. Confectionery Tobacco Snuff Tea Coffee Sugar and all sorts of Perfumery sold here. NB New laid Eggs every morning by Mrs Popjay." (*Medical and Physical Journal* 1815;**34**:189.)