PRACTICE OBSERVED

Practice Research

Management of childhood urinary tract infection in family practice

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Abstract

To find out to what extent doctors appreciate the potential damage that bacteriuria may cause, we sent questionnaires to 185 family practitioners and trainees in one health board in Northern Ireland. The results of the survey showed that, though doctors seemed to be aware of the risk of renal disease, this was not reflected in practice.

Introduction

Urinary tract infection is one of the major bacterial infections of childhood.¹ The incidence of symptomatic bacteriuria varies in published reports and with the diagnostic criteria used. Dickinson found an incidence of 1.7 per 1000 boys and 3.1 per 1000 girls at risk a year, while Katz and Smellie quoted 5% of all children.^{2,3} Winberg reported the incidence of recurrence as 50%.⁴ The incidence of associated radiological abnormalities has been reported to be as high as 50%.⁵ The child at greatest risk of developing renal damage is young with obstruction or pronounced reflux.⁶ Recognition of these children requires diagnosis by urine culture; and proper management aims at irrigating infection, investigation, possible antibiotic prophylaxis, possible surgical intervention, and long term follow up to detect recurrence and renal damage.¹⁻⁴

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We conducted a survey of the family practitioners in the Northern Health and Social Services Board, Northern Ireland, to determine to what extent the potential seriousness of this condition is appreciated and how it is managed in practice.

Method

A questionnaire was sent to all 195 family practitioners and practitioner trainees in the Northern Health and Social Services Board. The questions were designed to ascertain the practitioner's awareness of the risk of long term complications in a child who develops a urinary tract infection. The practitioners were asked to indicate measures taken to identify the presence of infection, further investigations (if any) arranged, and what follow up to detect recurrence is arranged. The completed questionnaire was subsequently returned anonymously through the post. (A few practitioners identified themselves.)

Results (table)

Of the 106 practitioners who do not always culture a midstream urine specimen before starting treatment, 52 usually do so and 17 do so occasionally. Of the 105 who do not always culture a specimen on completing treatment, 45 usually do so, 22 do so occasionally, and one never does so.

Response to 137 (70%) questionnaires returned by family practitioners

Question	Yes	No
Are long term complications possible?	130	
Is a midstream urine specimen necessary for diagnosis?	127	10
Is a midstream urine specimen always checked before starting treatment?	31	106
Is a midstream urine specimen always checked on completion of treatment?	32	105
Is follow up arranged?	112	52

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If the practitioner indicated that follow up was undertaken the answer was elaborated further. Twenty three (17%) practitioners indicated that they refer an affected child for investigations after a first infection and also arrange for further midstream urine specimens to be cultured; 11 (8%) other practitioners do likewise if the infection recurs; 29 (21%) refer after the first infection and do not arrange to check further urine specimens; 42 (31%) arrange to have further urine specimens checked and do not arrange referral for investigations. The remaining seven (5%) practitioners arrange for neither further urine specimens nor investigations, but volunteered the information that they check random urine specimens with Multistix (Ames).

Discussion

In general the practitioners who responded to the survey expressed an awareness of the importance of urinary infection in children, although this awareness is not seen to be reflected in practice. Several of the practitioners volunteered the widely appreciated view that urine collection may be technically difficult to achieve in a small child and also pointed out that they had difficulty in arranging culture of urine specimens at weekends. Such factors undoubtedly partly account for the fact that the minority of affected children will always have their infection documented with a midstream urine specimen. With regard to follow up of these children, there seemed to be

no uniform policy and under a half of all the practitioners arrange for further investigations.

The results of our survey suggest that despite well documented guidelines on managing this condition, both in hospital and in family practice, there still seems to be an inadequate appreciation of the need for complete assessment and long term follow up.¹⁻⁴ Until this is understood risk factors will be ignored and children will continue to be placed unnecessarily at increased risk of developing chronic pyelonephritis, hypertension, and renal failure.

We thank all the practitioners who responded to this survey.

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Developing a practice formulary as a byproduct of computer controlled repeat prescribing

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Abstract

We use our office computer to record and issue repeat prescriptions. Each month we look at a printout to see how many times a drug has been prescribed, with the goal of limiting our practice formulary. We have reduced by more than 10% the range of drugs that we use in the practice and have the possibility of knowing dose ranges, actions, interactions, and side effects of all the drugs used in the practice.

Introduction

Many doctors look to computerised repeat prescribing systems to reduce workload, improve accuracy, and increase control. A reduction in workload can come about only if the system is simple and quick to operate. Improved control may be achieved by ensuring that patients are recalled after a specified period and keeping a check on the number and date of "repeats." Accuracy

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is increased mainly by checking requests against the computer and by the clarity of printing, both on the prescription and on the printed request slip that some systems can produce for the patient. Another help to accuracy and control, however, is to limit, by agreement between partners, the number of drugs that they use in the practice. This partners may discuss an area of treatment and consider the relative merits of the various available preparations but not necessarily have to hand the current prescribing habits in the practice.

This paper describes how in our practice, using monthly computer printouts of the frequencies of drugs prescribed on a computer controlled system of repeat prescribing, it has proved possible to rationalise the drug formulary simply without unnecessarily limiting the choice of prescribing or upsetting the needs of patients.

System in our practice

The practice started using an office computer for repeat prescribing and other purposes in December 1981. The system has been described in part, but it is appropriate to give briefly the details that contribute to accuracy and control and show the important differences from other systems.¹ Drugs may be entered in the repeat prescription section of a patient's computer record in "free text" or coded form. There are many arguments for and against each method. The main disadvantage with free text is that a different spelling produces a different drug, and the problem with codes is the discipline of maintaining a code list. The latter also makes checking for drug interactions possible, although we have found the repeat prescribing stage a little late to detect this.

Most systems partly solve the problem of codes by providing a "dictionary" of many thousands of drugs from the *British National*

Formulary which it is also possible to amend. Codes may be of varying length and numeric or alphabetic. One is most simple—two-digit alphanumeric codes represent both drug name and strength and presentation and other symbols are not used to specify strength or presentation. This produces a long list of codes, but since we find that strengths and presentations are almost as much a source of error as the drug name itself then the list is representative.

From a detailed analysis of prescribing in the practice from the Prescription Pricing Authority in March 1981 we estimated a list of 480 such items. Table 1 shows a portion of the drug list that our staff use now. It is very simple to add to the list when desired; to delete, the computer must first check that a drug is not being prescribed. This concept of the practice actively controlling the size of its drug list on the computer, as well as through practice policies, is the most unusual feature of the system we use.

TABLE 1—A section of practice drug list (list—348 items)

Venolol 2 mg	V2
Venolol 4 mg	V3
Venolol 8 mg	V4
Venolol 16 mg	V5
Venolol 32 mg	V6
Venolol 64 mg	V7
Venolol 128 mg	V8
Venolol 256 mg	V9
Venolol 512 mg	V10
Venolol 1024 mg	V11
Venolol 2048 mg	V12
Venolol 4096 mg	V13
Venolol 8192 mg	V14
Venolol 16384 mg	V15
Venolol 32768 mg	V16
Venolol 65536 mg	V17
Venolol 131072 mg	V18
Venolol 262144 mg	V19
Venolol 524288 mg	V20
Venolol 1048576 mg	V21
Venolol 2097152 mg	V22
Venolol 4194304 mg	V23
Venolol 8388608 mg	V24
Venolol 16777216 mg	V25
Venolol 33554432 mg	V26
Venolol 67108864 mg	V27
Venolol 134217728 mg	V28
Venolol 268435456 mg	V29
Venolol 536870912 mg	V30
Venolol 1073741824 mg	V31
Venolol 2147483648 mg	V32
Venolol 4294967296 mg	V33
Venolol 8589934592 mg	V34
Venolol 17179869184 mg	V35
Venolol 34359738368 mg	V36
Venolol 68719476736 mg	V37
Venolol 137438953472 mg	V38
Venolol 274877906944 mg	V39
Venolol 549755813888 mg	V40
Venolol 1099511627776 mg	V41
Venolol 2199023255552 mg	V42
Venolol 4398046511104 mg	V43
Venolol 8796093022208 mg	V44
Venolol 17592186044416 mg	V45
Venolol 35184372088832 mg	V46
Venolol 70368744177664 mg	V47
Venolol 140737488355328 mg	V48
Venolol 281474976710656 mg	V49
Venolol 562949953421312 mg	V50
Venolol 1125899906842624 mg	V51
Venolol 2251799813685248 mg	V52
Venolol 4503599627370496 mg	V53
Venolol 9007199254740992 mg	V54
Venolol 18014398509481984 mg	V55
Venolol 36028797018963968 mg	V56
Venolol 72057594037927936 mg	V57
Venolol 144115188075855872 mg	V58
Venolol 288230376151711744 mg	V59
Venolol 576460752303423488 mg	V60
Venolol 1152921504606846976 mg	V61
Venolol 2305843009213693952 mg	V62
Venolol 4611686018427387904 mg	V63
Venolol 9223372036854775808 mg	V64
Venolol 18446744073709551616 mg	V65
Venolol 36893488147419103232 mg	V66
Venolol 73786976294838206464 mg	V67
Venolol 147573952589676412928 mg	V68
Venolol 295147905179352825856 mg	V69
Venolol 590295810358705651712 mg	V70
Venolol 1180591620717411303424 mg	V71
Venolol 2361183241434822606848 mg	V72
Venolol 4722366482869645213696 mg	V73
Venolol 9444732965739290427392 mg	V74
Venolol 18889465931478580854784 mg	V75
Venolol 37778931862957161709568 mg	V76
Venolol 75557863725914323419136 mg	V77
Venolol 151115727451828646838272 mg	V78
Venolol 302231454903657293676544 mg	V79
Venolol 604462909807314587353088 mg	V80
Venolol 1208925819614629174706176 mg	V81
Venolol 2417851639229258349412352 mg	V82
Venolol 4835703278458516698824704 mg	V83
Venolol 9671406556917033397649408 mg	V84
Venolol 19342813113834066795298816 mg	V85
Venolol 38685626227668133590597632 mg	V86
Venolol 77371252455336267181195264 mg	V87
Venolol 154742504910672534362390528 mg	V88
Venolol 309485009821345068724781056 mg	V89
Venolol 618970019642690137449562112 mg	V90
Venolol 1237940039285380274899244224 mg	V91
Venolol 2475880078570760549798488448 mg	V92
Venolol 4951760157141521099596976896 mg	V93
Venolol 9903520314283042199193953792 mg	V94
Venolol 19807040628566084398387907584 mg	V95
Venolol 39614081257132168796775815168 mg	V96
Venolol 79228162514264337593551630336 mg	V97
Venolol 158456325028528675187103260672 mg	V98
Venolol 316912650057057350374206521344 mg	V99
Venolol 633825300114114700748413042688 mg	V100

When the doctor decides that a patient may continue treatment by prescription for 30 months before review the receptionist adds a prescription "page" to the record of the patient on the age-sex register. For each item entered the drug code (instantly translated into full name on the screen) is followed by a one letter code for the dose and quantity, the latter on the basis of number of packs or 30 days' supply, together with the number of repeats taken of each. With this he can simply tick the items he requires next time without complicated lettering or numbering. In this way the use of the actual drug name is encouraged. The slip is also used to convey other information to the patient; including when he must see the doctor again and details particular to selected drugs. When the receptionist issues the repeat prescription the usual display is similar to the slip and unneeded items are deleted before the prescription is printed. Warnings are issued if the request is too early, and when the repeat prescription is expired by date or number of repeats it cannot be printed—we allow no over-riding. A particular feature of our system is that the computer produces a printout for updating the manual record when all allowable repeats have been taken or when the record is changed.

On FP10 Comp paper the prescription is printed on the left, and the space on the right is used in several ways by different systems—reminders on interactions for the doctor, retention by the doctor for reference, and as a repeat prescription slip for the patient's next prescription. We use the latter; each time the patient obtains a prescription he gets an updated slip with all his repeat drugs on, together with the number of repeats taken of each. With this he can simply tick the items he requires next time without complicated lettering or numbering. In this way the use of the actual drug name is encouraged. The slip is also used to convey other information to the patient; including when he must see the doctor again and details particular to selected drugs. When the receptionist issues the repeat prescription the usual display is similar to the slip and unneeded items are deleted before the prescription is printed. Warnings are issued if the request is too early, and when the repeat prescription is expired by date or number of repeats it cannot be printed—we allow no over-riding. A particular feature of our system is that the computer produces a printout for updating the manual record when all allowable repeats have been taken or when the record is changed.

Information available from the system

By using simple "menu options" the computer can produce lists of patients on particular drugs, lists of patients who have not had particular drugs from the computer system within 35 days, and lists of repeat prescription records that have either "expired"—that is, the date for review and reauthorisation by the doctor has passed or become "inactive" because no prescription has been printed for 120 days. All such printouts also identify the "prescribing" doctor. What we have found most interesting, however, is the complete list in order of potential frequency of prescribing of every drug in the practice formulary, with the number of patients to which each is prescribed (shown in part in table 1). This list represents potential and not actually prescribed items. It is possible to generate such a list, and to accumulate items over several months but has its own advantages.

Some practical experience

Over the two years that we have been using the computer it has gradually become clear that patients and doctors do not behave as predictably as computer programmers would like to think. Thus most of the authorisations for repeat prescriptions were never formally ended, either because the doctor did not convey this information from the consultation to the computer, or because patients were concerned in their own management stopped requesting their prescriptions. To attempt to regularise this seemed to us to give undue importance to the computer. It might, however, rapidly lead to an inflation of apparent repeat prescribing unless identified and make impossible the task of identifying non-compliance in essential areas of treatment. Investigating this led to starting a procedure in which our practice manager obtains monthly printouts of files that have expired for more than 120 days. They are deleted from the files of reauthorisable repeat prescriptions and the manual notes are presented to the doctor for his consideration.

Figures obtained after such a procedure are relevant to indicate the scale of computer repeat prescribing in the practice. On 28 January 1984 there were 1436 patients with files for repeat prescriptions out of 9528 on the age-sex register (which takes account of identifiable list infestation). This figure is still rising slowly. We estimate that it is both from an increase in prescribing non-steroidal anti-inflammatory drugs, bronchodilators, hypotensives, etc., and from more effective use of the system by the patients. Of these, 156 (11%) had "expired," 15 by 91-120 days, 16 by 61-90 days, 44 by 31-60 days, and 81 by 1-30 days. It is thus apparent that for many reasons other than non-compliance several months may pass between a patient running out of his last supplies of an authorised prescription and the repeat being re-established, and that after four months few are re-established in their original form. Thus the doctor may have to be asked to "re-establish" the patient again, some items may be taken "as required" and take some time to be used up after the "expiry" date, and the doctor may fail to reauthorise the prescription after the review consultation.

TABLE 2—Two sections of computer printout. Repeat prescribing list in order of frequency 28 January 1984, 1436 prescriptions files, 386 items

Ventolin Inhaler	126	Distalgic	11
Navidrex K	105	Euhypnos 10 mg	10
Mogadon	74	Brufen 400 mg	7
Tenorret	60	Halcion 0.25 mg	5
Trinistrin 0.5 mg 100	55	Becotide Inhaler	5
Cetiprin 100 mg	3	Clinoril 200 mg	
Colofac	3	Largactil 50 mg	
Phyllococtin	3	Trandate 400 mg	
Tenorret 50	3	Ventolin Syrup 300 ml	