Key messages

- There are widespread difficulties in recruiting general practitioners.
- In the short term recruitment is time consuming and stressful for practices.
- In the longer term the development of a primary care led national health service may be hindered.
- Practices in inner city and deprived areas have the most recruitment difficulties. Additional incentives are required to ensure high quality general practice in these areas with the greatest health needs.

entirely their own on call work received more applications than practices with access to deputising services or cooperatives. In view of the current debate it is interesting that fundholding status had no effect on ease of recruitment.

The most important finding from this study is that inner city practices and practices receiving deprivation payments attract fewer applicants. This may have always been the case, but the effects will be greater in the context of a general shortage. The relative reluctance of applicants to apply to deprived practices may be a reflection on the areas in which doctors wish to live, rather than a direct consequence of working conditions in such practices. The result, however, is to make it harder to recruit good quality applicants to areas which have the highest morbidity. This study suggests that deprivation payments have not proved sufficiently effective in raising the popularity of inner city areas. Additional incentives will be necessary if an even spread of quality of general practice is to be achieved.[7]

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A simple algorithm to predict the development of radiological erosions in patients with early rheumatoid arthritis: prospective cohort study

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Abstract

***Objective*—To produce a practical algorithm to predict which patients with early rheumatoid arthritis will develop radiological erosions.**

***Design*—Primary care based prospective cohort study.**

***Setting*—All general practices in the Norwich Health Authority, Norfolk**

***Subjects*—175 patients notified to the Norfolk Arthritis Register were visited by a metrologist soon after they had presented to their general practitioners with inflammatory polyarthritis, and again after a further 12 months. All the patients satisfied the American Rheumatism Association's 1987 criteria for rheumatoid arthritis and were seen by a metrologist within six months of the onset of symptoms. The study population was randomly split into a prediction sample (n = 105) for generating the algorithm and a validation sample (n = 70) for testing it.**

***Main outcome measures*—Predictor variables measured at baseline included rheumatoid factor status, swelling of specific joint areas, duration of morning stiffness, nodules, disability score, age, sex, and disease duration when the patient first presented. The outcome variable was the presence of radiological erosions in the hands or feet, or both, after 12 months.**

***Results*—A simple algorithm based on a combination of three variables—a positive rheumatoid factor test, swelling of at least two large joints, and a disease duration of more than three months—was best able to predict erosions. When the accuracy of this algorithm was tested with the validation sample, the erosion status of 79% of patients was predicted correctly.**

***Conclusions*—A simple algorithm based on three easily measured items of information can predict which patients are at high risk and which are at low risk of developing radiological erosions.**

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Introduction

The development of radiological erosions in patients with rheumatoid arthritis is accepted as an objective and reliable outcome measure of the disease process.[1] Erosive joint damage tends to occur early in the disease, with 90% of patients who develop radiological erosions doing so within two years of disease onset.[2] It has been suggested that, to limit joint damage, disease modifying treatment should be started before patients develop erosions.[3,4] Identifying which patients are at a high risk of developing erosions is therefore important in deciding appropriate management.

Several studies have examined the ability to predict which patients with rheumatoid arthritis will develop erosions, although their findings have been contradictory.[5] One reason for the lack of consistent findings is the varied strategies used to recruit the study populations. Most studies recruited patients from hospital outpatient clinics, thereby missing individuals managed solely by their general practitioners. Some studies were based on retrospective recruitment and so missed patients who had gone into remission. In this report we used a unique prospective cohort of individuals who presented to their general practitioners with a new onset of inflammatory polyarthritis. We aimed to identify those patients presenting with early rheumatoid arthritis who would subsequently develop radiological erosions, on the basis of clinical variables at presentation that were easily measurable. To validate the findings, we tested them in a further independent sample.

Patients and methods

THE NORFOLK ARTHRITIS REGISTER

The study population was selected from individuals recruited to the Norfolk Arthritis Register, which has been described in detail elsewhere.[6] This register attempts to identify prospectively all individuals registered with a general practitioner in the Norwich Health Authority who present to primary care with an inflammatory polyarthritis. Patients are visited by a metrologist at the time of notification and annually thereafter. At each visit patients are interviewed about their disease status and undergo a joint examination. Blood is taken for rheumatoid factor analysis and the titre obtained by using a tube latex test. At one year patients are asked to have *x* ray examinations of their hands and feet.

PATIENTS

Patients were eligible for inclusion in this study if (*a*) they satisfied any subset of the American Rheumatism Association's 1987 "tree" criteria for rheumatoid arthritis[7] when they were recruited to the arthritis register, (*b*) they were recruited to the study within 180 days of the onset of their first joint symptoms, (*c*) they had completed baseline and one year follow up assessments, and (*d*) they had provided a blood sample for rheumatoid factor testing at baseline.

In all, 239 patients who had been recruited to the register between 1990 and 1993 satisfied the inclusion criteria. A result from an *x* ray examination done at least 12 months after the onset of disease was available for 175 (73%) patients. We excluded 13 patients because their *x* ray examinations were done less than 12 months after the onset of disease. The other main reasons for missing *x* ray information were patients' refusal to have an *x* ray examination or failure to attend for the examination. Given the rural setting of this study, it was not surprising that some patients had not been prepared to travel to hospital for *x* ray examination. We compared demographic and clinical measures for the 175 patients with *x* ray information and the 64 patients without. The two groups were similar with respect to all variables except age. The patients with *x* ray information were slightly older than those without (mean age 59 and 54 years respectively). As age was not strongly associated with erosion status, selection bias was unlikely to have influenced the results. The 175 patients with *x* ray information form the study population.

OUTCOME AND PREDICTORS

The primary outcome measure was the presence of radiological erosions at least one year after onset of symptoms. The *x* ray films were read independently by two observers using Larsen's method.[8] In cases of dispute a third observer arbitrated. Larsen's method entails grading joints of the hands and feet using a series of standard films for comparison. For this study, patients were dichotomised according to whether any of the joint areas of the hands and feet showed radiological evidence of erosions (Larsen's grade 2 or higher).

The demographic, clinical, and laboratory variables recorded at the initial assessment were age, sex, duration of the disease, time between disease onset and *x* ray examination, duration of morning stiffness, swelling of each specific joint area, number of swollen joints, presence of rheumatoid nodules, and rheumatoid factor titre. The patients also completed a health assessment questionnaire—a validated self administered measure of physical function, with scores from 0 to 3 (0 = no disability, 3 = extreme disability).[9] Both age and the amount of time between disease onset and *x* ray examination were split into three categories. Duration of disease, defined as the length of time between the patient's reported onset of symptoms and when he or she was first examined by a metrologist from the arthritis register, was divided into "less than 90 days" and "90-180 days." Various patterns of joint involvement were recorded including symmetry, hand involvement, and involvement of large joints (knee, shoulder, or elbow). The cut off point for a positive result on rheumatoid factor testing was allowed to vary between a titre of 1:40 and 1:320. A potential trend effect between the titre and the development of erosions was also investigated, by calculating log(titre) and treating it as a continuous variable.

STATISTICAL METHODS

The study population was split into a prediction sample (60%, n = 105) and a validation sample (40%, n = 70) using the random sampling function in the STATA statistical program.[10] The purpose of having two samples was to validate the algorithm for predicting erosions in a separate independent group of patients.

The positive predictive value and the negative predictive value of each clinical variable were calculated by using the prediction sample. The positive predictive value represents the percentage of patients with that variable who subsequently developed erosions. The negative predictive value represents the percentage without that variable who did not develop erosions. The accuracy is the percentage of patients who were classified correctly. No single variable is likely to be sufficiently powerful to predict erosions. Therefore combinations of variables that correspond to high or low risks of erosions were sought. Logistic regression models were used to calculate the probability of erosion on the basis of specified subgroups of predictor variables. All of the predictor variables were used in a logistic regression model with erosion status as the dependent variable. The model was simplified in a stepwise fashion by removing variables which were negatively associated with outcome or had a P value of greater than 0.05. The final model was checked by adding back each of the dropped variables one at a time to ensure that none was related to the outcome, and also by removing all of the remaining variables in turn to ensure that all were necessary.

The probability of each patient in the validation sample developing erosions was calculated with the final model. If the estimated probability for an individual patient was greater than 0.5 then erosions were predicted. The positive and negative predictive values and accuracy of the model were calculated. These values should represent unbiased estimates for the model.

Finally, the effect of two possible confounding variables—use of steroids and use of second line drugs before *x* ray examination—was determined by including them in the final prediction model and recalculating the positive and negative predictive values and the accuracy.

Results

Table 1 shows the baseline, treatment, and outcome characteristics for the whole population and for the randomly generated prediction and validation groups. There were slight variations between the prediction and validation samples, the former having more patients aged 67 and over and more with a disease duration of less than 90 days.

In the prediction sample erosions developed more often in men than in women, and more often in individuals with a disease duration of more than 90 days (table 2). No apparent relation was seen between either age at onset or the length of time to *x* ray examination and the development of erosions. Use of second line drugs was related to outcome, although use of steroids was not. In all, 35% patients in the prediction sample had developed erosions at one year, and so the positive

Table 1—*Baseline, treatment, and outcome features of whole group, prediction sample, and validation sample of patients with rheumatoid arthritis. Values are numbers (percentages) of patients*

	Whole population (n = 175)	Prediction sample (n = 105)	Validation sample (n = 70)
Sex:			
Male	50 (29)	29 (28)	21 (30)
Female	125 (71)	76 (72)	49 (70)
Age (years):			
18-51	56 (32)	33 (31)	23 (33)
52-66	60 (34)	33 (31)	27 (39)
>66	59 (34)	39 (37)	20 (29)
Disease duration (days):			
0-90	91 (52)	59 (57)	32 (46)
91-180	84 (48)	46 (44)	38 (54)
Score ≥1 on health assessment questionnaire*	103 (59)	60 (58)	43 (61)
Erosions detected at one year	63 (36)	37 (35)	26 (37)
Treated with second line drugs	83 (47)	49 (47)	34 (49)
Treated with steroids	35 (20)	22 (21)	13 (19)

*0 = No disability, 3 = extreme disability.[9]

predictive value that would be expected by chance was 35%. Similarly, the negative predictive value expected by chance was 65%. Table 3 shows the predictive values and the accuracy of the various clinical predictors. Using a titre reading of at least 1:40 as a positive rheumatoid factor gave high positive and negative predictive values (accuracy 69%). These values were improved, however, by using a reading of at least 1:80 as a positive result (accuracy 71%). As the accuracy was not further improved by adopting higher cut off values the cut off value of 1:80 was adopted. Similarly, no significant trend was observed between log(titre) and the risk of developing erosions.

Metatarsophalangeal and large joint involvement provided only moderate predictive values, but choosing cut off points of metatarsophalangeal involvement of five or more joints and involvement of two or more large joints increased their predictive power substantially, resulting in accuracies of 68% and 69% respectively. The presence of knee and elbow involvement and a score of 1 or more on the health assessment questionnaire were also associated with the outcome. The results for 12 clinical predictors are not included in table 3 because their accuracy was 50% or less or because their prevalence was less than 5% or greater than 95%.

Table 2—*Relation between demographic and treatment variables and development of erosions in prediction sample (n = 105). Values are numbers (percentages) of patients*

	Erosions detected at one year	
	Yes	No
Overall	37 (35)	68 (65)
Sex:		
Male	15/29 (52)	14/29 (48)
Female	22/76 (29)	54/76 (71)
Age (years):		
18-51	13/33 (39)	20/33 (61)
52-66	11/33 (33)	22/33 (67)
>66	13/39 (33)	26/39 (67)
Disease duration (days):		
0-90	16/59 (27)	43/59 (73)
91-180	21/46 (46)	25/46 (54)
Time to *x* ray examination (days):		
361-505	12/35 (34)	23/35 (66)
506-620	17/35 (49)	18/35 (51)
>620	8/35 (23)	27/35 (77)
Treated with second line drugs:		
Yes	23/49 (47)	26/49 (53)
No	14/56 (25)	42/56 (75)
Treated with steroids:		
Yes	8/22 (36)	14/22 (64)
No	29/83 (35)	54/83 (65)

A logistic model for predicting erosions was constructed by using all the clinical variables, as well as age, sex, disease duration, and time to *x* ray examination. As described earlier, the model was refined until it included only three predictors: a positive result on testing for rheumatoid factor, involvement of two or more large joints, and a disease duration of over 90 days. The overall accuracy of this model was 76/105, similar to that of the model including all variables (75/103). No significant increase in the positive and negative predictive values or accuracy was observed when each of the omitted variables was added back. This model was therefore chosen as the final prediction model.

Because the prediction model consisted of three dichotomous variables, only eight risk groups were possible. The probability of developing erosions ranged from 0.13 if all three variables were absent to 0.89 if all three variables were present (table 4). The reliability of this model in predicting outcome was tested with the 70 patients in the validation sample. Of the 49 patients in the first four groups (table 4), 39 did not develop erosions—a negative predictive value of 80%. Of the 21 patients in the last four groups who were predicted to develop erosions, 16 did so, a positive predictive value of 76%. The overall accuracy of the criteria was 55/70 (79%). Finally, the potential confounding effect of use of second line drugs or steroids, or both, was assessed by adding them to the three final prediction variables. When these were tested in the validation sample the positive and negative predictive values and the accuracy of this new model were 72%, 82%, and 79% respectively. Given the similarity of these figures to those obtained from the original model, these variables did not seem to be acting as confounders.

Discussion

The main finding from this study is that the probability of developing erosions for patients who present with rheumatoid arthritis can be determined by using three readily available clinical and laboratory measures. When this model was tested in an independent validation sample, 79% of the patients were correctly classified.

POSSIBLE BIASES

Two factors in this study may have led to the positive predictive value being underestimated and the negative value being overestimated. Firstly, some patients classified as having no erosions will later develop erosions. The effect of such misclassification, however, is likely to be small as 90% of patients who develop erosions begin to do so within two years of onset of symptoms,[2] and the median time between onset and *x* ray examination was 18.5 months in the present study. Secondly, there is a potential confounding effect of treatment with second line drugs or steroids, or both—that is, patients who were destined to develop erosions may have received treatments that prevented any radiological change. The treatment given to patients in this study was based on the routine clinical practice of each patient's rheumatologist or general practitioner and was not influenced by the investigators. Of the 175 patients, 83 (47%) were prescribed second line drugs, the most common being sulphasalazine (66/83). This is similar to the treatment of patients with newly diagnosed rheumatoid arthritis reported elsewhere.[11] Treatment is unlikely to have had a strong confounding effect because when an attempt was made to adjust for treatment in the logistic regression model the positive and negative predictive

Table 3—*Positive and negative predictive values and accuracy for clinical predictor variables*

	No of patients with erosions/No with variable	Positive predictive value (%)	No of patients with no erosions/No without variable	Negative predictive value (%)	% Accuracy
Rheumatoid factor test:					
Titre ≥1:80	19/31	61	56/74	76	71 (75/105)
Titre ≥1:40	20/36	56	52/69	75	69 (72/105)
Metatarsophalangeal involvement	10/29	34	49/76	64	56 (59/105)
Metatarsophalangeal involvement of ≥5 joints	10/17	58	61/88	69	68 (71/105)
Involvement of:					
≥2 Large joints	13/22	59	59/83	71	69 (72/105)
Large joints	18/43	42	43/62	69	58 (61/105)
Knee	15/37	41	46/68	68	58 (61/105)
Elbow	6/15	40	59/90	66	62 (65/105)
Score ≥1.0 on health assessment questionnaire*	23/60	38	29/43	67	50 (52/103)

Joint symmetry, wrist involvement, ankle involvement, morning stiffness, number of joints involved, metacarpophalangeal involvement, and proximal interphalangeal joints had an accuracy of less than 50%.
Prevalence of involvement of nodules, hip, and shoulder was less than 5% and of hand or three or more joints was greater than 95%.
*Unavailable for two patients.

values and the accuracy were unchanged. However, given that some confounding may be present and that some patients may have been misclassified as having no erosions, the estimated positive predictive value of 76% should be interpreted as a minimum and the estimated negative value of 80% as a maximum.

DISEASE DURATION

The association between disease duration at first assessment and subsequent outcome in rheumatoid arthritis is complex, and various factors need to be considered. Disease duration may simply be a measure of chronicity or persistence. Against this explanation are the findings of a subsequent analysis that a shorter disease duration was not associated with remission two years after disease onset (unpublished data). Alternatively, delay in presentation may represent a primary risk factor for subsequent erosions. Although the interval between symptom onset and presentation was not measured directly, it is likely to be closely associated with disease duration when first assessed by the metrologist. Most notifications to the arthritis register were made by general practitioners after the first or second visit and not by a rheumatologist, and the metrologists aimed to conduct interviews within a fortnight of notification.

It is important to distinguish between these two explanations. If chronicity is the critical factor then a patient who presents at two months will have a higher probability of developing erosions one month later if the algorithm is reapplied. If the time to presentation is the critical factor then our algorithm can be applied at any time and the patient's probability of developing erosions remains the same. Further work is needed to investigate these factors, but we believe that the current evidence is in favour of early presentation being the explanation of good prognosis, and our algorithm should be applied accordingly.

Certain patterns of onset of rheumatoid arthritis may lead patients to present early or late to medical care, with late presentation being associated with a worse prognosis. Young *et al* found that patients with an insidious onset (and who are therefore likely to present late) had a worse outcome radiologically.[12] The association between time to presentation and subsequent prognosis may also be explained by the existence of an important therapeutic window in the early months of disease during which treatment has the greatest potential to control and possibly reverse inflammation. Patients who delay in presenting will therefore miss the opportunity for early treatment. Fifty of the 91 early presenters were treated with second line drugs or steroids before their *x* ray examination, with treatment being started in the first three months after symptom onset in 30 of these patients. A slightly higher proportion of the patients (64%) who presented between four and six months after their onset of symptoms were also treated with second line drugs before their *x* ray examination, although they lacked the opportunity for treatment within the first three months of their disease.

Table 4—*Probability of developing erosions in the eight risk groups estimated from prediction sample and tested on validation sample*

	Variables					
Risk group	Rheumatoid factor titre ≥1:80	Disease duration ≥3 months	Two or more large joints involved	Sample size in prediction group	Probability of developing erosions	Observed outcome in validation group*
1	Negative	No	No	34	0.13	2/11
2	Negative	Yes	No	25	0.26	3/17
3	Negative	No	Yes	8	0.37	2/10
4	Positive	No	No	14	0.46	3/11
5	Negative	Yes	Yes	7	0.59	4/6
6	Positive	Yes	No	10	0.67	7/10
7	Positive	No	Yes	3	0.77	0/0
8	Positive	Yes	Yes	4	0.89	5/5

*Negative predictive value 80% (39/49); positive predictive value 76% (16/21).

Table 5—*Summary of articles investigating the relation between clinical predictors and radiological erosions in rheumatoid arthritis*

Study	Sample size	Association of variable with erosions: Positive rheumatoid factor	Male sex	Older age at onset	Disease duration	Pattern of joint involvement	Nodules	Morning stiffness	Score on health assessment questionnaire
Suarez-Almazor *et al*, 1994[16]	126	Yes	No	No	NI	NI	Yes	NI	NI
Luukkainen *et al*, 1983[17]	107	Yes	NI	Yes	NI	NI	NI	NI	NI
van Zeben *et al*, 1993[19]	132	Yes	NI	No	NI	Yes*	Yes	No	Yes
Caruso *et al*, 1990[20]	315	Yes	No	No	NI	Yes†	NI	NI	NI
Young *et al*, 1988[12]	149	Yes	No	No	Yes	Yes*‡	NI	Yes	NI
Sjoblom *et al*, 1984[21]	103	Yes	Yes	NI	NI	NI	NI	NI	NI
de Carvalho *et al*, 1980[23]	188	Yes	NI	NI	NI	NI	Yes	NI	NI
Kaarela, 1985[24]	200	Yes	NI	Yes	NI	Yes*‡	Yes	Yes	Yes
van der Heide *et al*, 1995[25]	128	Yes	No	No	NI	Yes*	NI	NI	No

NI = not investigated.
*Number of joints affected. †Hand involvement. ‡Symmetry.

PREVIOUS STUDIES

Predicting radiological outcome in patients with rheumatoid arthritis has been the subject of 14 separate studies over the past 20 years.[12-25] The findings of studies based on at least 100 patients are summarised in table 5. A positive rheumatoid factor was strongly associated with radiological outcome in all studies. This is of interest as the various studies used different tests to measure rheumatoid factor titre, including latex fixation, haemagglutination, and enzyme linked immunosorbent assay (ELISA), as well as different cut off points for a positive result. In the present study, in which a latex test was used, patients with a titre of 1:40 seemed to have the same risk of developing erosions as seronegative patients, and the most accurate cut off point for predicting erosions was a titre of 1:80. No strong dose-response relation was observed when considering values greater than 1:80. When our algorithm is applied, a titre of 1:80 should therefore be used to indicate a positive result. The final prognostic variable, large joint involvement, was not investigated in any of the previous studies. In the present study involvement of a single large joint was not useful for prediction purposes, and only when two or more large joints were involved did this variable became a strong marker of predicting erosions. Thus involvement of large joints predicts the development of erosions in small joints. As this unexpected result was confirmed in the replication sample it is unlikely to have been the result of chance.

The findings of previous studies have not led to a consensus on which patients with rheumatoid arthritis have the worst prognosis radiologically. Possible reasons for this are methodological weaknesses in the design and analysis of the studies.[5] Most studies were carried out retrospectively on recruited patients who had had the disease for several years. All studies concentrated on hospital outpatient clinics, thus missing patients who were managed solely by their general practitioners. None suggested a practical way of applying their results in routine clinical practice. Some studies carried out only univariate correlation analyses, and none used positive and negative predictive values. Most importantly, only one study validated its results in a second, independent sample.[20] The present study was able to overcome these problems. The Norfolk Arthritis Register's population should represent an unbiased sample of individuals with rheumatoid arthritis who seek treatment at a primary care level.

Finally, while those at high risk of developing erosions clearly need prompt and aggressive treatment, other considerations regarding outcome are also important. Our data show that 43% of patients with no erosions had a score of ≥ 1 on a health assessment questionnaire when they initially presented, which represents moderate disability. Treatment decisions for all patients with rheumatoid arthritis therefore need to be made in the light of both current symptoms and future prognosis. The algorithm presented in this paper could be used to show the urgency for starting disease modifying treatments or for hospital referral in those most likely to develop erosions. In this study 25% of patients with rheumatoid arthritis who developed erosions were managed solely by their general practitioners. Knowing which patients in the primary care setting are at high or low risk of developing erosions should help to guide management decisions.

Key messages

- Of every 10 patients who present to primary care with rheumatoid arthritis, about four will develop radiological erosions over the following 12 months
- Identification of which patients are at low risk and which at high risk of developing erosions may be achieved using three variables—rheumatoid factor status, swelling of two or more large joints, and a disease duration of >90 days
- Information on risk of erosions may be helpful for decisions on treatment and referral

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Are community mental health teams providing an equitable service? Comparison of source of referrals with inpatient care

Richard Laugharne, Simon Fleminger

Some researchers have suggested that community mental health teams may have policies that result in those most in need not receiving priority for services and may thus not provide an equitable service.[1 2] Referral practices of general practitioners have been suggested as a source of inequity.[3 4] We investigated the factors affecting which patients are referred to a community mental health team by comparing the demographic characteristics of people referred to one community team with those of patients being admitted to hospital and also with the general population.

Method and results

The community mental health team serves a multiethnic population of 52 059 (of whom 32 783 are aged 15-64) in a deprived inner city area. It accepts referrals directly from general practitioners (many practice alone or in two-handed practices), psychiatric outpatient clinics, inpatient wards, social workers, health visitors, and elsewhere. We examined retrospectively consecutive referrals to the team over 18 months and also inpatient records. Information on the population was obtained from the 1991 census and records of the department of public health. The figures used were for adults aged 15-64 years. Over the 18 months 119 patients from the study area were admitted to the acute adult psychiatric wards and 513 were referred to the community mental health team. Patients referred to the team were significantly younger than those admitted as inpatients: 36.1 years (SD 12.0) *v* 39.1 (13.0) (*t* test 2.26, P = 0.024).

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Table 1—*Percentages of the general population registered with different sizes of practices and of psychiatric inpatient admissions and referrals to the community mental health team*

Size of practice	General population (n = 32 783)	Inpatients (n = 119)	Referrals to community mental health team (n = 513)
Single partner	25.9	23.6	14.7
Two partners	49.2	53.8	28.4
Three or more partners	24.9	21.7	55.8
No GP		0.9	0.5
Missing data (No)		13	38

Referrals to team *v* population: $\chi^2 = 244.1$, df = 2, P = 0.0001. Referrals to team *v* inpatients: $\chi^2 = 41.3$, df = 2, P = 0.0001. Inpatients *v* population: $\chi^2 = 1.1$, df = 2, P = 0.57.

There was a large difference between referrals to the community mental health team, inpatient admissions, and the general population in terms of the size of general practice with whom subjects were registered. In the general population about a quarter were registered with practices with a single doctor, one half with practices with two, and one quarter with practices of three or more (table 1). The inpatient admissions showed no significant difference from this pattern, but there was a large overrepresentation of people referred to the community mental health team from large practices: the rate of referral from larger practices was four times that of the other two groups of practices. Of the patients referred to the team 310 were referred by their general practitioner and 195 from other sources. For those patients referred from primary care there was an even greater overrepresentation from larger practices (68.8% of referrals). For the referrals from other sources the distribution was closer to that of the general population, though larger practices were still overrepresented (31.1% of referrals).

Comment

Patients registered with general practices of three or more doctors are four times more likely to be referred to the community mental health team than are patients registered with smaller practices, contrasting with the findings of the inpatient population, where the distribution of patients is little different from that of the general population. If anything, patients from large practices are underrepresented among inpatients, though not significantly so.

Our interpretation of the findings is that the rates of inpatient admissions are a crude indicator of levels of psychiatric morbidity. Therefore the different rates of referral to the community team reflect inequalities in accessing this psychiatric service rather than different levels of need. General practitioners from larger practices might have a lower threshold for referral or detect more mental illness, or general practitioners from smaller practices might refer more to the outpatient department and the accident and emergency department.

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