PAPERS AND ORIGINALS

Effect of general practitioners' advice against smoking

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Summary and conclusions

During four weeks all 2138 cigarette smokers attending the surgeries of 28 general practitioners (GPs) in five group practices in London were allocated to one of four groups: group 1 comprised non-intervention controls; group 2 comprised questionnaire-only controls; group 3 were advised by their GP to stop smoking; and group 4 were advised to stop smoking, given a leaflet to help them, and warned that they would be followed-up. Adequate data for follow-up were obtained from 1884 patients (88%) at one month and 1567 (73%) at one year. Changes in motivation and intention to stop smoking were evident immediately after advice was given. Of the people who stopped smoking, most did so because of the advice. This was achieved by motivating more people to try to stop smoking rather than increasing the success rate among those who did try. The effect was strongest during the first month but still evident over the next three months and was enhanced by the leaflet and warning about follow-up. An additional effect over the longer term was a lower relapse rate among those who stopped, but this was not enhanced by the leaflet and warning about follow-up. The proportions who stopped smoking during the first month and were still not smoking one year later were 0·3%, 1·6%, 3·3%, and 5·1% in the four groups respectively ($P < 0.001$).

The results suggest that any GP who adopts this simple routine could expect about 25 long-term successes yearly. If all GPs in the UK participated the yield would exceed half a million ex-smokers a year. This target could not be matched by increasing the present 50 or so special withdrawal clinics to 10 000.

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Introduction

A potentially highly effective approach to smoking in Great Britain remains virtually untried—namely, collective effort by all 20 000 and more general practitioners (GPs). Over 90% of adults visit their GP at least once in five years,[1 2] the average number of attendances exceeding three in a year,[3] and smokers attend at least as often as non-smokers.[4] Thus GPs see over 18 million of the 20 million smokers in Britain at least once every five years, and most of them much more often. Although mass media may be used to confront smokers on a similar scale, face-to-face communication may be more persuasive,[5] especially for the less-well-educated majority, among whom anti-smoking campaigns have been less effective.

The role of special withdrawal clinics is limited by the size of the problem. They also attract relatively few smokers, and those who do attend seem to be the most difficult cases, who are highly dependent and have less chance of success. GPs, on the other hand, see all kinds of smokers, including those who are more likely to succeed and will not necessarily need intensive treatment and support. The potential of GPs working collectively is so immense that a genuine success rate of even 5% nationally would be more useful than far higher success rates obtained by more intensive methods at specialised clinics.

In chest clinics,[6 7] screening clinics,[8 9] and hospitals[10] straightforward, firm advice to stop smoking, without any accompanying treatment or support, may be as effective as protracted treatment at special withdrawal clinics. Attempts by GPs to persuade patients to stop smoking have had varied results,[11–14] and it is not clear what the average long-term success rate would be if simple but firm advice to stop smoking were given routinely by GPs to all their patients who smoke cigarettes. We therefore decided to assess this. A printed instruction leaflet was given to some patients to see whether this would increase compliance.[15 16]

Subjects and methods

DOCTORS

Twenty-eight of the 29 doctors in five group practices in London took part; the remaining doctor, who was a smoker, declined. A further nine doctors participated while serving as locums. Of the 28

GPs, six were cigarette smokers, four pipe-cigar smokers, and 11 ex-smokers; seven had never smoked. The practices were at South Woodford (practice 1), Ilford (practice 2), Kentish Town (practice 3), Herne Hill (practice 4), and Peckham (practice 5). They were selected for convenience, two being nearby, and to provide some spread between inner city and outer suburb. Practices 2 and 3 were sited in the newer type of local authority health centre, the other three being traditional practices set up by the GPs. No practice that we approached refused to participate. The doctors and their patients were therefore reasonably representative of general practice in London.

PATIENTS

The sample comprised all cigarette smokers aged 16 or more who attended the surgeries to see a doctor during the four weeks 29 April to 26 May 1974. Those who attended solely to collect a prescription or see a nurse were excluded. The screening question "Are you a cigarette smoker?" was put to all eligible patients, and those who said "yes" were included in the trial. Patients who were "uncertain" were included if they had stopped smoking less than two weeks before, but all subjects who said "no" were excluded even if they had given up cigarettes for only two or three days.

A total of 2138 eligible cigarette smokers attended the surgeries during the four weeks. Of these, 1884 (88%) provided adequate data on follow-up at one month, and 1567 (73%) also gave adequate data on follow-up at one year. Most of the losses at one month were due to administrative and procedural difficulties not attributable to the patients, so that the sample was more representative than suggested by the response rate of 88%. About two-thirds of the additional losses at one year were due to changes of address.

ADVICE AND CONTROL PROCEDURES

The patients were assigned to one of four groups. *Group 1* served as controls and simply had their names taken for follow-up; *group 2* completed questionnaires to control for possible "questionnaire effects" but were not advised to stop smoking; *group 3* were advised to stop smoking; and *group 4* were advised to stop smoking, given an information leaflet (see below), and warned that they would be followed up.

The advice to stop smoking was simple but firm. It was given in the doctors' own style over one or two minutes during the routine consultation. The four-page information leaflet, "How you can give up smoking," was issued by the Department of Health and Social Security and distributed to all family doctors in 1968. Ideally the leaflet and the warning about follow-up should have been given separately as well as together, but this would have meant substantially enlarging the study.

ASSIGNMENT TO GROUPS

Random allocation of consecutive patients to groups as they arrived in a busy surgery would not have been feasible. Hence eligible patients were assigned according to their day of attendance, those attending on a certain day being allocated to the same group. Each group was based on the total intake of eligible patients on each day of the week except Sunday. Days, weeks, and "sequence" over the four weeks were balanced across groups.

One or two interviewers were posted in each practice, who selected eligible patients, administered the questionnaires, and ensured that correct procedures were followed. Special procedures were adopted to help the doctors follow the protocol correctly. Errors and cases in which doctors thought it was unethical to give or withhold advice were noted.

QUESTIONNAIRES

Four questionnaires were used, which were anonymous and identified by numerical codes. Pilot tests in general practices were satisfactory.

The *smoking questionnaire* contained 31 questions, mainly concerned with smoking attitudes and habits. It was brief and simple and designed to be completed during the 15-20 minutes' wait before seeing the doctor. The information obtained was therefore limited and did not include, for example, social class. It was given to all patients in groups 2-4.

The *attitude-stability check* repeated six questions from the smoking questionnaire and was completed by patients in groups 2-4 immediately after seeing the doctor. The questions reflected changes in attitudes to smoking and motivation to stop smoking after the doctors' advice. Reproducibility in a pilot study was satisfactory ($r = 0{\cdot}8$-$0{\cdot}9$).

The *one-month follow-up sheet* was posted to patients in all groups exactly one month after the index attendance. It was headed "Smoking stability questionnaire" and contained six questions about current smoking and attempts to stop smoking or make some other change in smoking over the month after attendance. It was sent with a stamped-addressed envelope and a photocopied letter from the doctor expressing an interest in whether and how much people change their smoking habits for various reasons. Since it was the first questionnaire for group 1 no reference was made to the other questionnaires, advice from the doctor, or attendance at the surgery one month before. A reminder was sent three days later in all cases. After two weeks non-respondents were sent another follow-up sheet, covering letter, and stamped-return envelope. This was repeated at three weeks by recorded delivery. Any who had still not responded were visited by an interviewer.

The *one-year follow-up sheet*, headed "Smoking survey: final follow-up," was posted to patients in all groups in May 1975, one year after the index attendance. It contained seven questions about current smoking, desire to give up smoking, and attempts to stop or change smoking habits over the past four weeks. Five of the questions were the same as in the one-month follow-up sheet. Postal and follow-up procedures were similar to those at one month.

BIOCHEMICAL VALIDATION

Validation of self-reported outcome was obtained in 23 patients by measuring nicotine concentrations in saliva.[17] Fourteen claimed to have stopped smoking, and the salivary nicotine values were consistent with this in all but one, giving a deception rate of 7%. The selection of these patients was not satisfactory, however, so that the deception rate of 7% may not be reliable.

Results

There were no significant differences between the five practices in any measure of outcome at one month or one year or in attitude, motivation, and intention changes immediately after receiving advice from the doctors. The results for the five practices were therefore pooled and are presented together.

TABLE I—*Changes in attitude, motivation, and intention immediately after consultation with doctors* (group 1 were not given questionnaires and are therefore excluded). Except for dissonant smokers† results expressed as mean scores of responses on four-point or five-point scale*

		Group 2 (n = 543)	Group 3 (n = 511)	Group 4 (n = 520)	Significance of difference between groups
Percentage of dissonant smokers	Before	68·7	71·6	68·5	NS
	After	67·1	73·7	73·9	P < 0·02
	Change	−1·6	+2·1	+5·4§	P < 0·01
Want to stop smoking	Before	2·90	3·04	2·88	NS
	After	2·91	3·14	3·08	P < 0·02
	Change	+0·01	+0·10‡	+0·21‖	P < 0·005
Want to go on smoking	Before	3·05	3·04	2·96	NS
	After	3·12	3·02	3·04	NS
	Change	+0·06	−0·02	+0·08	NS
Worry about smoking	Before	1·91	2·03	2·02	NS
	After	1·85	2·03	2·07	P < 0·002
	Change	−0·05	+0·01	+0·05	P < 0·05
Confidence in ability to give up smoking	Before	3·00	2·92	3·06	NS
	After	2·92	2·95	3·00	NS
	Change	−0·09	+0·03	−0·06	NS
Intention to give up smoking	Before	2·08	2·18	2·16	NS
	After	2·03	2·35	2·41	P < 0·0001
	Change	−0·05	+0·17‖	+0·24‖	P < 0·0001

*Results based on people who answered each question both before and after consultation (on average, 93%, 94%, and 92% of groups 2, 3, and 4 respectively).
†A dissonant smoker is one who would like to stop if he could do so easily.[18]
Significance of changes within groups — ‡P < 0·05, §P ≤ 0·01, ‖P ≤ 0·001.

EFFECT ON ATTITUDE, MOTIVATION, AND INTENTION

Table I shows the changes in attitude to smoking, motivation to give up smoking, confidence in the ability to give up smoking within the next three weeks, and intention to give up smoking completely within the next three weeks immediately after seeing the doctor. As expected, there were no significant differences between the groups in any measure before seeing the doctors; nor were there any significant changes after seeing the doctors in group 2, who received no advice. Simple advice (group 3) produced a slight increase in the desire to stop smoking. It also increased the intention to give up smoking completely within three weeks. This effect was significantly enhanced by the leaflet and the doctors' warning about follow-up (group 4). The effect on worry about smoking was minimal. There was no significant decrease in the desire to continue smoking, nor increase in confidence in the ability to stop, even when the advice was accompanied by the leaflet and warning about follow-up.

The variable most sensitive to advice and enhancement by the leaflet and warning about follow-up was the intention to stop smoking within the next three weeks. Before seeing the doctors only 10·0%, 12·4%, and 9·6% of groups 2-4 respectively said that they "probably" or "definitely" intended to stop compared with 9·4%, 19·0%, and 17·8% afterwards, these changes being significantly greater in the advice groups than in group 2 ($P < 0.001$; t tests on net proportions).

ONE-MONTH FOLLOW-UP

Tables II-IV show the changes in smoking behaviour at the one-month follow-up.

Spontaneous changes in smoking—Although patients in group 1 received neither advice nor the questionnaire, 10·2% tried to stop smoking during the month, and 3·0% claimed to have stopped. The success rate among group 1 patients who tried to stop was 28·6%. Thirty-one point four per cent attempted some change other than stopping, and 19·0% said that they had reduced their cigarette consumption, the average reduction claimed being 4·5 daily.

Questionnaire effect—Simply completing the smoking questionnaire apparently had no influence on smoking habits over the next month, the outcome in group 2 at one month being similar to that in group 1 (tables II-IV).

Effect of simple advice—Compared with the controls (groups 1 and 2 combined) patients given simple advice but not the leaflet or warning about follow-up (group 3) showed a slight increase in the proportions who tried to stop (table II) and managed to stop smoking (table III). These differences, however, were not significant. There was no tendency for patients in group 3 to show a higher rate of attempting other changes in their smoking. Nor did simple advice significantly increase the success rate of those who attempted to stop (table IV).

Effect of advice, leaflet, and warning about follow-up—Compared with the controls (groups 1 and 2 combined) group 4 patients showed a significantly higher rate of trying to stop smoking ($\chi^2 = 17.8$; DF = 1; $P < 0.001$) but were not more likely to try other changes (table II). These patients also showed a greater tendency to stop smoking ($\chi^2 = 14.3$; DF = 1; $P < 0.001$; table III). This was mainly due to the higher rate of trying to stop, since the slightly higher success rate among those who tried (42·2% in group 4 compared with 30·0% in groups 1 and 2 combined) was not significant ($\chi^2 = 2.4$; DF = 1; table IV). Slightly more patients reduced their consumption in group 4 than in groups 1 and 2 (table III), but the difference was not significant. None of the differences between groups 3 and 4 at the one-month follow-up was significant.

TABLE II—*Results at one-month follow-up: percentages of smokers reporting attempt to modify smoking habit*

	Group 1 (n = 411)	Group 2 (n = 519)	Group 3 (n = 471)	Group 4 (n = 483)	Significance of difference
Attempted to stop	10·2	9·2	13·2	17·2	$\chi^2 = 17.9$; $P < 0.001$
Attempted other change*	31·4	28·7	33·8	31·5	$\chi^2 = 2.1$; NS
Attempted nothing	58·4	62·1	53·0	51·3	$\chi^2 = 14.7$; $P < 0.005$

*Of those attempting other change, 85% tried to reduce consumption; only 3% attempted change to pipe or cigars and 7% to lower-tar brand.

TABLE III—*Results at one-month follow-up: percentages of smokers reporting change in smoking behaviour**

	Group 1 (n = 401)	Group 2 (n = 502)	Group 3 (n = 453)	Group 4 (n = 466)	Significance of difference†
Stopped smoking	3·0	3·0	4·6	7·5	$\chi^2_L = 12.1$; $P < 0.001$
Reduced smoking	19·0	17·3	20·3	21·5	$\chi^2 = 2.9$; NS
No change	78·1	79·6	75·0	71·0	$\chi^2 = 11.2$; $P < 0.02$

*Table contains 62 patients (3·3%) fewer than in table II, as data on changes achieved were missing. Patients who made other changes comprised 15 who gave up cigarettes and changed to pipe or cigars and 25 who changed to lower-tar brand; they are included in "no-change" category.
†$\chi^2_L = \chi^2$ test for linear trend.

TABLE IV—*Results at one-month follow-up: success rate among those who attempted to stop smoking*

	Group 1	Group 2	Group 3	Group 4	Significance of difference*
No who attempted to stop	42	48	62	83	
No (%) who succeeded	12 (28·6)	15 (31·3)	21 (33·9)	35 (42·2)	$\chi^2_L = 2.7$; NS

*$\chi^2_L = \chi^2$ test for linear trend.

ONE-YEAR FOLLOW-UP

Of the 1884 patients with adequate data on follow-up at one month, 1567 gave adequate data on follow-up at one year. Most of the losses were due to changes of address. Losses varied considerably with different practices—namely, 15·9%, 9·6%, 29·1%, 16·9%, and 11·8% in practices 1 to 5 respectively ($\chi^2 = 56.4$; DF = 4; $P < 0.001$). There were, however, no significant differences between the practices in any measure of outcome at one year. Furthermore, the losses were similar in the four groups (17·3%, 16·8%, 16·8%, and 15·5%; $\chi^2 = 0.6$; NS). This and the fact that the patients lost to follow-up did not differ significantly in their initial cigarette consumption and response at one month suggest that their loss did not substantially bias the results at one year.

Long-term success—The effect of the advice on long-term success was highly significant (table V). As compared with 0·3% of the controls in group 1, 5·1% of patients in group 4 stopped smoking during the month after the index attendance and were still not smoking after one year.

TABLE V—*Results at one-year follow-up: percentages of subjects smoking and not smoking**

	Group 1 (n = 340)	Group 2 (n = 430)	Group 3 (n = 389)	Group 4 (n = 408)	Significance of difference†
Still smoking	89·7	86·0	83·3	80·9	$\chi^2_L = 12.2$; $P < 0.001$
Not smoking	10·3	14·0	16·7	19·1	
Stopped by one month	0·3	1·6	3·3	5·1	$\chi^2_L = 24.5$; $P < 0.001$
Stopped after one month	8·8	11·2	12·9	13·0	$\chi^2_L = 3.5$; NS
Don't know when stopped	1·2	1·2	0·5	1·0	

*Six subjects who had stopped by one month relapsed and stopped again. They are included as stopped by one month.
†$\chi^2_L = \chi^2$ test for linear trend.

Effect on stopping after one-month follow-up—Most of those not smoking at one year had stopped some time after the one-month follow-up (table V). Indeed, of the 225 patients not smoking at one year, 100 (44%) had stopped during the month before. Some effect of the advice was still apparent for up to four months, significantly more smokers in the advice groups stopping during the three months after the one-month follow-up (5·6% in groups 1 and 2 as compared with 11·1% in groups 3 and 4; $\chi^2 = 4.95$; $P < 0.05$). The effect did not persist, however, over months 5-7 (7·8% *v* 4·4%; $\chi^2 = 0.1$; NS).

Effect on relapse rate—Of the 83 patients who had stopped smoking

at one month, 68 (8, 10, 19, and 31 in groups 1 to 4 respectively) were followed up at one year. Of these, 7, 3, 6, and 10 patients from the four groups respectively relapsed and were smoking again. With Fisher's exact test (two-tailed) groups 3 and 4 each differed from group 1 at the 1% level, suggesting that advice from the GP reduced the tendency to relapse.

CIGARETTE CONSUMPTION

Table VI gives the changes in average cigarette consumption in each group, which reflect the combined results of reducing and stopping smoking. Although the decreases were significantly greater in groups 3 and 4, the differences were extremely small. There were further small but significant decreases in consumption between the one-month and one-year follow-ups in all groups.

Light smokers were more likely to stop smoking. Initial consumption by those who stopped at one month averaged 11·0 cigarettes daily as compared with 16·7 daily in those who achieved no change ($P < 0.001$).

TABLE VI—*Cigarette consumption initially and one month and one year later (expressed as mean number of cigarettes daily)*

	Group 1 (n = 340)	Group 2 (n = 430)	Group 3 (n = 389)	Group 4 (n = 408)	Significance of difference†
Initially*		16·2	16·6	15·7	NS
At one-month follow-up	16·6	15·2	15·4	13·9	$P < 0.005$
At one-year follow-up	15·1	14·2	13·7	13·1	$P < 0.02$

*Initial cigarette consumption not available in group 1 as they were not given initial questionnaire. Average initial consumption in other three groups was 16·2 cigarettes daily.
†Significance of differences between groups tested by analyses of variance for linear trend.

COMPARISON OF INDIVIDUAL DOCTORS

There was pronounced variation in the results achieved by different doctors. Their success rates at the one-month follow-up in terms of the proportions of their patients in the advice groups (3 and 4) who stopped smoking ranged from nil to 11%. The numbers of patients seen by each doctor, however, were too small for such differences to reach significance. An analysis of the relation of the success rates of individual doctors to such variables as their own smoking habits and their technique of giving advice will be reported separately.

Discussion

EFFECT OF ADVICE

The results show that the GPs' advice to stop smoking was effective and that it was enhanced by the leaflet and warning about follow-up. Changes in attitude, motivation, and intention to stop smoking were evident immediately after the advice was given. At the one-month follow-up 7·5% of the patients in group 4 had stopped smoking compared with 3·0% of the controls, suggesting that about 4·5% of patients responded by stopping smoking. Some effect was also apparent over the ensuing three months, significantly more patients in the advice groups giving up smoking. The advice also significantly reduced the relapse rate between the one-month and one-year follow-ups. In terms of long-term success, 5·1% of smokers in group 4 stopped smoking within one month and were still not smoking after one year compared with 0·3% of the controls—a true long-term success rate of almost 5%.

The effect of the advice was quite specific. Motivation and intention to stop were increased, as was the proportion of patients who tried to stop. Confidence in the ability to give up smoking was not increased, however, and neither was the success rate in those who tried. Similarly, attempts to reduce smoking and their success were not increased by the advice. Also the rates of changing to low-tar cigarettes or to a pipe or cigars were extremely low. Since the leaflet contained tips on how to stop smoking it might have been expected to enhance the success rate in those who tried or to reduce the relapse rate in those who managed to stop, but this was not the case. Confidence in the ability to stop was scored immediately after the leaflet was given and before it had been read. Hence, though it might have been expected to increase confidence, it would not have affected the confidence rating.

Changes and differences in mean daily cigarette consumption, though consistent with the other changes in smoking behaviour, were extremely small. This was partly because the advice had no effect on the rate of reducing smoking but also because it was light smokers rather than heavy smokers who tended to stop, so that there was little effect on mean consumption by the groups as a whole.

Thus the main effect of the advice was to cause more people to stop smoking. This was achieved in the short term by motivating more of them to try to stop rather than increasing the success rate among those who did try. An additional effect over the long term was the lower relapse rate among those who stopped. Giving the leaflet and warning about follow-up enhanced the short-term effect but had no added effect over the longer term.

IMPLICATIONS OF RESULTS

In group 4, who were advised to stop smoking, given the information leaflet, and warned that they would be followed up, there were 21 patients who claimed to have stopped smoking within the next month and when followed up one year later said that they were still not smoking. If, for extreme stringency, we assume that all those who for reasons not of their own making were excluded, not traced, or failed to provide adequate data were smoking at the time of the one-year follow-up and base the 21 successes at one year on the 530 patients originally allocated to group 4, the long-term success rate based on all the cigarette smokers (not all who attempted to stop) was 4%. This may seem low compared with the 20-25% long-term success rates reported by some withdrawal clinics, but since GPs see so many cigarette smokers during their routine work and withdrawal clinics have such difficulty attracting clients the following comparison may be more appropriate. The 21 one-year successes in group 4 were the result of advising one week's intake of smokers by 28 GPs. If we subtract from this the average of 4 spontaneous long-term successes a week in groups 1 and 2 and a further 2 to allow for a deception rate of 12% (it was actually 7%) the net yield of ex-smokers was 15 a week for 28 GPs. This is equivalent to at least one every fortnight or 25 a year for each GP.

These results therefore suggest that if all 20 000 and more GPs in Britain were to adopt this simple measure the total yield could exceed half a million ex-smokers a year, and possibly similar results could be obtained for several ensuing years. This target is unlikely to be matched by setting up 10 000 specialised smoking withdrawal clinics.[18] With more experience, better leaflets, self-recording booklets, and the availability of non-time-consuming aids such as nicotine chewing-gum (expected soon as a prescribable drug) the results should improve further.

We hope that our findings will encourage individual GPs to do their share and prompt the various health authorities to ensure that the necessary aids and information are readily and freely available to all GPs.

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Inhibition of reticuloendothelial function by gold and its relation to postinjection reactions

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Summary and conclusions

A patient with rheumatoid arthritis developed severe exacerbation of symptoms 18 hours after an injection of gold thiomalate (sodium aurothiomalate). Immune complexes were present in his serum and synovial fluid; in the synovial fluid they were associated with intense complement activation. The effect of gold salts on splenic reticuloendothelial function was determined by measuring the clearance of heat-damaged erythrocytes from the circulation. Gold thiomalate (50 mg) substantially delayed clearance in the patient but had no effect in four other patients with rheumatoid arthritis who had not had a postinjection reaction. Severely impaired clearance also occurred in three out of four healthy people given 100 mg gold but they remained asymptomatic.

The postinjection reaction may be an immune-complex disease that is triggered in certain patients because gold transiently inhibits reticuloendothelial function.

Introduction

Gold is well established for treating rheumatoid arthritis, and in several clinical trials[1-3] treatment not only reduced symptoms but slowed or even halted the disease. The major limiting factor of gold is the incidence of toxic effects: mucocutaneous manifestations are the commonest, but other side effects such as marrow depression and the nephrotic syndrome are well documented. A side effect that has not been well defined is the transient increase in rheumatic symptoms after the injection of gold—the so-called non-vasomotor postinjection reaction. These reactions are usually mild but occasionally may be so severe that treatment is stopped prematurely. We have investigated a patient who had a severe postinjection reaction and present here evidence suggesting that the side effect is initiated by a pronounced inhibitory effect of gold thiomalate (sodium aurothiomalate) on the reticuloendothelial system.

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Case report

A 48-year-old man with seropositive nodular rheumatoid arthritis resistant to non-steroidal anti-inflammatory drugs began treatment with gold. He was given a test dose of gold thiomalate (Myocrisin) 10 mg intramuscularly and a week later received 50 mg. Next day he felt generally unwell: the arthralgia and joint stiffness were much more severe, and effusions were noted in knees and ankles. He was confined to bed for 24 hours and did not fully recover for three days. During the illness his general practitioner prescribed chlorpheniramine (Piriton) 4 mg thrice daily. Clinical recovery coincided with taking this drug.

Methods

Serum and plasma samples—Blood samples were allowed to clot at room temperature, separated, and stored in small aliquots in liquid nitrogen. Synovial fluid was stored similarly. Plasma was removed from blood collected into EDTA (final concentration 0·01 mol/l) and stored in small aliquots in liquid nitrogen. Synovial fluid was also collected into EDTA before storage.

Complement, C-reactive protein, and albumin concentrations—C1q, C3, C4, C-reactive protein (CRP), and albumin were measured by radial immunodiffusion with monospecific antisera. Functional total haemolytic complement (CH_{50}) and alternative pathway activity were