

Tranquillizer use in middle-aged British men

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SUMMARY. We have examined the use of tranquillizers by 7,735 middle-aged men currently enrolled in the British Regional Heart Study, a prospective study of cardiovascular disease in 24 towns throughout Great Britain. Tranquillizer use was reported by 620 men (8 per cent). There was a slightly greater prevalence of tranquillizer use in the older men and the non-manual workers. Men with physical disease diagnosed by their doctor or by objective measurements during the study were more likely to be using tranquillizers than men with no physical disease. This was most evident for ischaemic heart disease, however diagnosed, and for hypertension diagnosed by their doctors. There was an inverse relationship between drinking and tranquillizer usage: heavy drinkers had lower rates of usage. There was no association between tranquillizer use and smoking habits.

This study indicates that tranquillizer use in these middle-aged men is little influenced by age, social class or smoking, but that there is a strong, positive association between tranquillizer use and the presence of doctor-diagnosed physical disease. While our data provide support for the suggestion that alcohol and tranquillizers may be used interchangeably by some individuals, this finding could also be an outcome of doctors' and patients' awareness of the undesirable effects of combining alcohol and tranquillizers.

Introduction

THE widespread prescription and cost of tranquillizers has focussed attention on several areas of their usage. These include variations in tranquillizer use with

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age and social class (Paris *et al.*, 1973), a high prevalence of use in patients with physical illness (Williams, 1978), and the possible substitution of tranquillizers for tobacco smoking and alcohol consumption by some patients (Priest, 1980; Taylor, 1981). Information on these topics is available from the British Regional Heart Study (RHS), a prospective study of cardiovascular disease which includes a clinical survey of 7,735 middle-aged men drawn from general practices in 24 towns throughout England, Wales and Scotland. This paper describes tranquillizer use by these men, and its associations with age, social class, physical ill-health, unemployment, cigarette smoking and alcohol consumption.

Materials and methods

The British Regional Heart Study

The RHS is a national epidemiological study which attempts to explain variations in cardiovascular mortality by analysis of geographic, climatic and socio-economic data (Pocock *et al.*, 1980), and by the study of town-by-town variations in the prevalence of cardiovascular risk factors (Shaper *et al.*, 1981). Details of the selection of the 24 towns, the general practices and the 7,735 men aged 40-59 have been published (Shaper *et al.*, 1981). The men were selected at random from the age and sex registers of one general practice in each town. During the enrolment survey, nurses administered a standard questionnaire that incorporated questions on medicinal drug use, smoking and drinking habits, and medical history. Additional data included height, weight, blood pressure, pulmonary function tests, electrocardiographs and blood samples for a wide range of biochemical and haematological measurements.

Tranquillizer use

The men were asked two major questions about their use of tranquillizers:

1. Regular use. "Are you on any regular medical treatment from a doctor for any condition?" If yes, "Do you know if the pills/medicines/injections are tranquillizers?"
2. Recent use. "Have you taken any tranquillizers in the last 48 hours?"

Table 1 shows that those who answered 'yes' to one of these questions were likely to have said 'yes' to both. In this paper a tranquillizer user is defined as someone who answered 'yes' to either question (440 + 131 + 49 = 620). We did not attempt to validate the answers by review of general practitioner records, nor did we request information on the duration and quantity of use, or the names of specific drugs.

Table 1. Response to questions about tranquillizer use in middle-aged British men.

Regular tranquillizer use	Recent tranquillizer use	
	Yes	No
Yes	440	131
No	49	7,098

Table 2. Tranquillizer use by age and social class in middle-aged British men.

	Number of men	Percentage on tranquillizers
Age group		
40-44	1,830	7.1
45-49	1,895	7.1
50-54	1,969	9.0
55-59	2,024	8.7
Total	7,718	8.0
Social class		
I	606	9.7
II	1,729	9.9
IIINM	717	7.8
IIIM	3,324	6.3
IV	780	10.5
V	318	9.1
Armed services	231	5.6
Total	7,705	8.0

Smoking and drinking

The men were grouped as: non-cigarette smokers, ex-cigarette smokers, and light (1-19 per day), moderate (20 per day) and heavy (more than 20 per day) cigarette smokers. Pipe/cigar smokers were classified with the non-cigarette smokers if they had never smoked cigarettes and with the ex-cigarette smokers if they had previously smoked cigarettes. A detailed questionnaire on current drinking status (Cummins *et al.*, 1981), similar but not identical to that used in the General Household Survey, allowed us to classify drinking behaviour into eight groups as follows: non-drinkers, occasional (special occasions or 1-2/month), weekends only (1-2, 3-6 or >6 drinks per day) and daily or most days (1-2, 3-6 or >6 drinks per day). A drink is defined as half a pint of beer, a glass of wine/sherry or a single tot of spirits.

Social class

Each man was grouped within one of the six social classes of the Office of Population Censuses and Surveys (OPCS) based upon his longest held occupation: professional (I), managerial (II), skilled non-manual (IIINM), skilled manual (IIIM), semi-skilled manual (IV), and unskilled manual (V). The armed services formed a separate class.

Employment

There were two groups of unemployed men in the RHS: those who at the time of their interview said that they did not have a job because of ill-health (254), and those who lacked a job but not because of ill-health (148). Retired men were excluded.

Physical illness

Estimates of possible physical disease were obtained in three ways. First, a standardized series of questions was used to diagnose bronchitis (Medical Research Council, 1976) and ischaemic heart disease (Rose, 1962). In this report we have combined simple, chronic and mucopurulent bronchitis together as 'bronchitis', and angina and possible myocardial infarction together as 'ischaemic heart disease'. Second, physical measurements of blood pressure (mean of two readings, five minutes apart, subject seated, phase V diastolic, London School of Hygiene sphygmomanometer) and pulmonary function (forced vital capacity (FVC) and forced expiratory volume in one second (FEV₁) using a vitalograph, J49-B2 model) were used to diagnose hypertension and obstructive lung disease respectively. We defined hypertension as a mean of two diastolic readings equal to or greater than 100 mm Hg, and defined obstructive lung disease (OLD) as a ratio of FEV₁ to FVC of less than 67 per cent (Saunders, 1975). Third, a doctor-diagnosed illness variable was obtained by asking the men if a doctor had told them that they had any of 13 common medical problems (see Table 3). This variable was the subjects' report of doctor diagnoses and was not validated by a review of his records.

Missing data

It was not possible to categorize tranquillizer use in 17 of the 7,735 men. In the remaining 7,718, social class data were missing in 13, smoking data in 14 and drinking data in five. In addition, information was not available for IHD (20), bronchitis (22), OLD (84), hypertension (12) and doctor-diagnosed illness (27).

Results

Tranquillizer use, age, social class, marital status and town

A total of 620 men (8.0 per cent) of the 7,718 were tranquillizer users. There were small differences between five-year age groups and between the social classes (Table 2). Men over 50 had a slightly greater prevalence of tranquillizer use (8.9 per cent) than men under 50 (7.1 per cent), and non-manual workers had a greater prevalence (9.4 per cent) than manual workers (7.2 per cent). These small differences were statistically significant ($p < .05$) but are probably of little clinical importance. Since our sample is based on one general practice within each town, town and general practice are synonymous in our data. The variation in tranquillizer use by town was from 6 per cent in Wigan to 14 per cent in Maidstone. Adjustment for age, social class and town in later tabulations for this paper made minimal differences and therefore crude rates (that is non-adjusted) are presented. The prevalence of tranquillizer use differed little between marital status groups: married 8.0 per cent (559/6,973), single 7.8 per cent (29/374), widowed 10.2 per cent (10/98) and other 8.1 per cent (22/273).

Physical illness

Table 3 gives the rates of tranquillizer use for men who reported certain doctor-diagnosed illnesses. Generally the rate is higher than that seen in subjects with no

Table 3. Reported illnesses diagnosed by doctor and prevalence rates of tranquillizer use by specific illness. Illnesses are not mutually exclusive and any individual may have more than one condition.

Illness	Number of men	Percentage on tranquillizers
Angina	252	20.6
Possible myocardial infarction	279	20.4
Other heart trouble	528	12.9
High blood pressure	987	12.5
Stroke	52	21.2
Diabetes	117	11.1
Peptic ulcer	837	10.4
Gout	199	8.5
Gallbladder disease	132	14.4
Thyroid disease	49	8.2
Arthritis	779	12.7
Bronchitis	1,393	9.1
Asthma	286	9.4
None	3,853	5.8
Total	7,718	8.0

Table 4. Tranquillizer use in relation to the number of reported doctor-diagnosed illnesses in any one individual. Illness categories used are only those listed in Table 3, with angina and possible myocardial infarction regarded as one category.

Number of doctor-diagnosed physical illnesses	Number of men	Percentage on tranquillizers
None	3,853	5.8
1	2,447	8.3
2	994	12.6
3	304	13.2
4 or more	93	24.7

doctor-diagnosed illnesses, but what stands out are the exceptionally high rates for angina, possible myocardial infarction and stroke. Table 4 shows the rate of tranquillizer use in men with various numbers of doctor-diagnosed illnesses, using only the categories in Table 3 and with angina and possible myocardial infarction regarded as one category. The greater the number of these diagnoses, the greater is the prevalence of tranquillizer use.

Table 5 presents the prevalence of tranquillizer use in relation to four major physical illness categories. These diagnoses are listed by the method in which the illness was defined: by standard questionnaire only (ischaemic heart disease and bronchitis), by physical measurement only (OLD and hypertension), by the doctor only, by both doctor and questionnaire or physical measurement, and illness not present by these definitions. Of these major physical illnesses, ischaemic heart disease appears to be the disease process associated with the highest rate of tranquillizer use. This is true whether ischaemic heart disease was defined by the standard

questionnaire (11.8 per cent) or by the doctor (14.0 per cent). When ischaemic heart disease was present by both methods of diagnosis, the use of tranquillizers was very high (21.8 per cent). The group of men with hypertension diagnosed only by the doctor also had a high rate of tranquillizer use (13.7 per cent), but the men with hypertension by our objective definition only did not have a higher rate of tranquillizer use (8.6 per cent).

Smoking and drinking

The prevalence of tranquillizer use in the various smoking categories displays no distinctive pattern (Table 6). There is certainly no decrease in tranquillizer use with an increase in cigarette smoking. Contrary to the expectation that ex-smokers might have an increased prevalence of tranquillizer usage, they used tranquillizers at approximately the same rate as non-smokers and current smokers. Between the drinking groups, however, there were striking differences in tranquillizer use (Table 7). At one extreme, the 466 non-drinkers have a prevalence of tranquillizer use of 15.2 per cent, while the heavy weekend drinkers have a prevalence of 5.2 per cent. In part these high rates amongst the non-drinkers may be due to the higher prevalence of physical illness in this group. Table 7 (4th column) does show high percentages of men with one or more doctor-diagnosed illnesses in non-drinkers, but also in heavy weekend drinkers and in moderate and heavy daily drinkers. However, non-drinkers have a significantly higher rate of doctor-diagnosed angina or possible myocardial infarction than any other drinking group. We have no measure of past drinking amongst the non-drinkers.

The weekend and daily drinkers not only have far lower rates overall than the non-drinkers, but there is a significant decrease in tranquillizer use with increased alcohol intake within each group. That weekend drinkers have lower rates than daily drinkers may be in part a social class effect: III-manual men tend to be weekend drinkers and overall they have lower rates of tranquillizer use (Table 2).

Unemployment

The relationship between unemployment and ill-health is being examined by the RHS and our detailed observations will be presented in a separate publication. We have noted, however, some interesting associations between unemployment and tranquillizer use and will comment briefly on them in this paper. The unemployed/ill men had a higher rate of tranquillizer use (28 per cent) than the unemployed/not ill (9 per cent) or the employed men (7 per cent). It would appear that unemployment, independent of ill-health, is not associated with an unusually high rate of tranquillizer use. However, in a separate study of employment status and health, we have observed that the unemployed/not ill men have a higher rate of illness, using objective measurements made during the clinical survey, than employed men. They either do not report or do not

Table 5. Tranquillizer use in relation to four major illness categories, by method of diagnostic definition.

Method of definition	IHD		Bronchitis		OLD		Hypertension	
	Number	Percentage on tranquillizers	Number	Percentage on tranquillizers	Number	Percentage on tranquillizers	Number	Percentage on tranquillizers
Illness absent	6,781	7.2	5,578	7.7	6,423	7.9	6,188	7.3
Standard questionnaire only	638	11.8	731	8.2	—	—	—	—
Physical measurement only	—	—	—	—	1,211	8.5	532	8.6
Doctor-diagnosis only	50	14.0	891	9.3	—	—	730	13.7
Both doctor and questionnaire or physical measurement	229	21.8	499	8.6	—	—	256	8.9

Table 6. Tranquillizer use by cigarette-smoking status.

Smoking status	Number of men	Percentage on tranquillizers
Non-smokers	1,810	6.8
Ex-smokers	2,712	8.1
Current cigarette smokers		
Light (<20/day)	1,188	10.8
Moderate (20/day)	834	6.2
Heavy (>20/day)	1,160	8.3
Total	7,704	8.0

perceive this illness. The problem, therefore, is to disentangle the independent effects of unemployment and illness on the prescribing of tranquillizers. It seems reasonable to assume that ill patients, whether employed or unemployed, will have increased contact with their doctors, and that this contact increases the possibility that tranquillizers will be prescribed. We cannot at this time state whether the high use of tranquillizers in the unemployed/ill was due to the effects of illness or of unemployment.

Independence of the associations

Thus far we have presented the prevalence of tranquillizer use in a univariate manner, that is by one variable at a time. In order to determine the extent to which the different associations might be interrelated, and thus dependent upon one another, we have carried out a more sophisticated analysis using multiple logistic regression (Cox, 1970). In this model, we have included age (in five-year age groups), social class (seven categories), drinking (eight categories), number of doctor-diagnosed illnesses (none to four or more in five categories) and the presence of ischaemic heart disease (angina or possible myocardial infarction on questionnaire). The relationships demonstrated in the univariate tables remained present at a significant level ($p < .001$) for each variable except age, indicating that each of the

variables except age had an independent association with tranquillizer use. The increased use of tranquillizers with age in our study appeared to be explicable in terms of increased physical illness with age. Smoking was not included, as there did not appear to be any consistent association with tranquillizer use.

Discussion

Our main observations on the use of tranquillizers in these middle-aged men are:

1. The more doctor-diagnosed physical illness a man has, the higher is the prevalence of tranquillizer use.
2. Tranquillizers are used to an unusually high degree in men with the symptoms or diagnosis of ischaemic heart disease.
3. There is no association between tranquillizer use and cigarette smoking.
4. A decreased consumption of alcohol is associated with an increased use of tranquillizers.

The RHS was not undertaken to explore psychotropic drug use in any detail, so that detailed information on quantity, type and duration of tranquillizer use was not sought. Records were not reviewed to confirm diagnoses made by doctors or the frequency of consultations or drug prescriptions, and it is doubtful whether such an attempt at validation would have been either practical or reliable. We did not measure anxiety, the process usually associated with tranquillizer use, as this was not an objective of the study. However, the RHS possesses some advantages for addressing these topics: because the questions on drug use and alcohol consumption were contained within a large series of questions relating to health, diet and physical activity, the likelihood of dissembling by the men was greatly reduced; in addition, the large number of men enrolled in the RHS allowed multiple factors to be analysed and controlled for, and valid patterns to emerge.

Table 7. Tranquillizer use by drinking status and number of doctor-diagnosed illnesses. Chi-square tests for trend within weekend and daily drinkers are significant at the 5 and 1 per cent levels respectively.

Drinking status	Number of men	Percentage on tranquillizers	Percentage with ≥ 1 doctor-diagnosed illnesses	Percentage with doctor-diagnosed angina or possible infarction
Non-drinkers	466	15.2	53.3	10.4
Occasional	1,839	7.8	47.7	5.9
Weekend				
1-2	724	7.7	47.3	4.3
3-6	1,234	6.8	46.7	5.2
>6	1,093	5.2	52.7	4.4
Daily				
1-2	581	10.8	46.0	5.5
3-6	945	9.9	52.1	4.1
>6	831	6.0	56.4	4.6

Associations with physical disease

Our data support a positive association between the presence of physical disease diagnosed by general practitioners (Tables 2 and 3) and increased use of psychotropic drugs. This association has been observed by other workers using a variety of methods, and is present even after psychiatric and functional diseases have been excluded (Maguire and Granville-Grossman, 1968; Eastwood and Trevelyan, 1972; Cooperstock, 1974; Williams, 1974; National Drug and Therapeutic Index, 1975; Wheatley *et al.*, 1975; Wilks, 1975; Engel, 1976; Lasagna, 1977). In terms of cause and effect, the relationship between psychiatric and physical morbidity remains unclear. Individuals with long-standing physical disorders may experience anxiety and thus receive tranquillizers. The opposite sequence, in which anxiety leads to physical illness, may occur, and certain individuals might even have a propensity to both physical and psychiatric ill-health (Eastwood and Trevelyan, 1972). In addition, any association between psychiatric problems and physical morbidity will be complicated by the problem of repeated consultations, whether the consultations are primarily for anxiety or for physical disease. The more physical illness a person has, the more he is likely to consult with his doctor. These repeated consultations may lead the doctor to suspect that the physical symptoms are manifestations of an underlying anxiety state (Balint, 1964). This in turn increases the probability that tranquillizers will be prescribed. Tables 3 and 4 independently support this suggestion, for they show an increase in tranquillizer use with an increase in doctor-diagnosed illnesses, especially ischaemic heart disease and hypertension. Even when possible myocardial infarction, angina and stroke are excluded from Table 4, the association between increased numbers of doctor-diagnosed illness and increased tranquillizer use remains. In a similar manner, repeated consultations primarily for the symptoms of anxiety increase the probability both that tranquillizers will be prescribed

and that any concurrent physical diseases will be detected. It has been observed, for example, that the simple act of consulting the doctor increases the probability of receiving a psychotropic drug, regardless of the reason for the consultation (Howie and Bigg, 1980).

One cannot simply conclude from these data that doctors prescribe tranquillizers to treat physical diseases. The specific therapeutic intent may be to alleviate the anxiety that accompanies the disease. The National Drug and Therapeutic Index Project in the United States noted that only one third of minor tranquillizer prescriptions were ordered specifically for a mental disorder; the majority were given to patients whose primary diagnosis was physical. When asked their therapeutic reason for tranquillizer prescriptions, most of the doctors replied that the drugs were given to reduce emotional and psychic symptoms (National Drug and Therapeutic Index, 1975; Lasagna, 1977).

Nevertheless, the high rate of tranquillizer use in men with ischaemic heart disease (11.6 to 22 per cent depending on method of diagnosis) and those with doctor-diagnosed hypertension (13.7 per cent) merits further comment. Anxiety and stress acting via the catecholamines and the autonomic nervous system have frequently been suggested as causes of elevated blood pressure, arrhythmias and sudden cardiac death (Engel, 1976), and as contributors to atherosclerosis (Chapman *et al.*, 1966; Rosenman *et al.*, 1966; Eastwood and Trevelyan, 1971; Theorell, 1981). It is possible that the doctors in the RHS accept and act upon this concept. They may view ischaemic heart disease and hypertension as anxiety-related illnesses, and are using tranquillizers not just for the associated emotional elements, but to prevent and treat the disease itself.

The alcohol-tranquillizer substitution theory

Alcohol, benzodiazepines and barbiturates affect behaviour in a similar manner (Gray, 1973). Because of this, it has been suggested that some people may use

alcohol and tranquillizers interchangeably for their similar effects (Wilks, 1975; Priest, 1980; Taylor, 1981). Specifically, it is suggested that as certain groups of people decrease their alcohol consumption, for whatever reason, there will be an increase in tranquillizer use. If this substitution does occur to any large extent, it would be expected that, on a population basis, non-drinkers would have the highest prevalence of tranquillizer use and that the prevalence of tranquillizer use would decrease with increasing levels of drinking. The evidence, however, is inconsistent. Two large cross-sectional surveys in Australia failed to show any greater tranquillizer use in subjects with lower levels of alcohol consumption (Reynolds *et al.*, 1976; Gibson *et al.*, 1977), while work in America suggests that people view alcohol and drugs as alternative ways of coping with emotional distress and the crises that occur in life (Mellinger *et al.*, 1978). In the American study the final choice between the two depended on age, sex and psychosocial and cultural factors.

Our data would seem to provide some support for the substitution theory. Both in the weekend and the daily drinkers there is a significant gradient of increased tranquillizer use with decreased alcohol intake. While the data support the theory, they cannot confirm it, as we did not study change in drinking status relative to tranquillizer use. Men use alcohol for a variety of reasons: as a tranquillizer, as a beverage with meals and as a social lubricant (Edwards *et al.*, 1972). If the substitution theory is correct, it would be expected to operate predominantly in those drinkers for whom 'tranquillization' was the major drinking motive. We have no way of isolating such a group for analysis within the RHS data, nor of determining their relative proportion and the degree to which they might be responsible for the gradient observed in Table 7. If there is a substitution relationship between alcohol and tranquillizers, then it is possible that a decrease in the prescribing of tranquillizers could result in an increased alcohol intake (Priest, 1980). Once again, this remains speculative and our data cannot contribute to resolving such issues.

Tranquillizer use in middle-aged British men is strongly influenced by the presence of doctor-diagnosed illness, in particular various forms of cardiovascular disease. The inverse relationship observed between tranquillizer use and drinking may reflect the warnings that doctors give their patients not to mix drugs and alcohol. Doctors may also be reluctant to prescribe tranquillizers to patients known or suspected to be drinking heavily (Committee on the Review of Medicines, 1980). The relationship may also reflect patients' awareness of the undesirability of mixing tranquillizers and alcohol. We cannot explore these suggestions from our present data. Finally, the problem of tranquillizer use in association with heavy drinking appears to be small: only 50 (6 per cent) of the heavy drinkers in the study were also using tranquillizers.

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Antacids inhibit absorption of cimetidine

Three potent antacids (magnesium hydroxide and aluminium hydroxide alone and in combination) were all found to inhibit the absorption of cimetidine in fasting normal subjects and in patients with duodenal ulcers. The authors conclude that the two should not be taken simultaneously.

Source: Steinberg, W. M. *et al.* (1982). *New England Journal of Medicine*, **307**, 400-404.

Age, social class and Down's syndrome

The occurrence of Down's syndrome is 10 times less likely if the mother is under 20 than if she is 35 or over. There is also a strong correlation with social class, the rate for social class V being nearly twice the average; for women in social class V aged 35 or over the rate is 10 times the average.

Source: OPCS Monitor MB3 82/2. Malformation ratios by father's social class and mother's age, Down's syndrome, 1974-1979.

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