

Longitudinal studies of family units

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SUMMARY. In this paper the transmission of illness and illness behaviour from grandparents to their children and grandchildren is discussed. Maternal grandmothers are found to have most influence. Some prediction of the frequency of new periods of illness among the grandchildren was possible by making use of the number of nervous disorders of the grandparents for which medical help was requested. As family doctors, general practitioners are in a favourable position to anticipate and try to prevent the transmission of inadequate illness behaviour from generation to generation.

Introduction

IN the course of our medical education we learn that illness and disease are specific to individuals and that the one-to-one relationship between a patient and a doctor is an appropriate model on which to base treatment. However, man is a social being and I believe his health is determined not only by his predecessors but also by his social surroundings.

Ten years ago I documented¹ the medical history of a number of families, using meticulous notes made during 30 years in rural practice. I also described the results of an investigation of the medical data of samples of 100 younger and 100 older families over 20 years. A marked individual consistency in the presentation of illness was demonstrated over the years. A patient who was often (or seldom) ill at the beginning of the period tended to show the same characteristic throughout the period. Marked similarities in the frequency of illness were also demonstrated between husband and wife but more especially between parents and children. Further categorization of the data revealed that the incidence of disorders of the skin, of the upper and lower respiratory tract, of gastrointestinal disorders and of accidents were all similar within families. Several other studies have confirmed that the family unit is an important factor in illness.²⁻¹¹

Survey of three generations

The survey of 200 families ended in 1965 but a computer-based continuous morbidity register has been kept in the practice since 1967, allowing three generations to be studied.¹²

Data for 50 grandfathers, 49 grandmothers, 91 fathers, 91 mothers, 127 sons and 144 daughters are presented here. Recording started in 1945 for the grandparents and in 1945 or in the year of birth for their children. Recording started in 1967 for the grandchildren or in their year of birth and ended for all the patients in 1979 or with their death. During this period each new episode of illness for which medical help was requested and a diagnosis recorded was counted once. For each patient the number of new episodes of illness per year of observation was

calculated and compared with those of all individuals in the same age, sex and generation categories of the study population. The patients were then classified as having a high or low morbidity frequency.

New episodes of illness

Figure 1 shows the statistically significant relationships between the grandparents, parents and children with respect to the relative frequency of new episodes of illness. There are significant correlations between the parents and their sons and daughters, while there is only one significant correlation between the grandparents and parents and that is between grandfathers and their sons. This differs markedly from the figures for these same families over the period 1945-65 (Table 1). There are several possible reasons for this reduction in significant correlations. First, the numbers of grandparents and parents in this study are smaller as only a proportion of the children stayed in the practice after their marriage. Secondly, the observation period is longer and covers the grandparent's old age with its inherent degenerative and malignant diseases.

Significant relationships are also found between grandparents and their grandchildren (Figure 1). Maternal grandmothers appear to dominate and there are no significant relationships between paternal grandmothers and their grandchildren. Paternal grandfathers seem to have had an influence on granddaughters but not on grandsons. The relationship between maternal grandfathers and grandsons just failed to reach significance.

Table 1. Correlation between family members for the total number of diagnoses over the period 1945-65.

Correlation between:	Spearman's correlation coefficient	
	Older families (n = 89)	Younger families (n = 100)
Grandfathers and parents	0.49***	0.30**
Grandmothers and parents	0.46***	0.45**
Grandfathers and grandmothers	0.26*	0.22*

n = number of families. *** P<0.001, **P<0.01, *P<0.05.

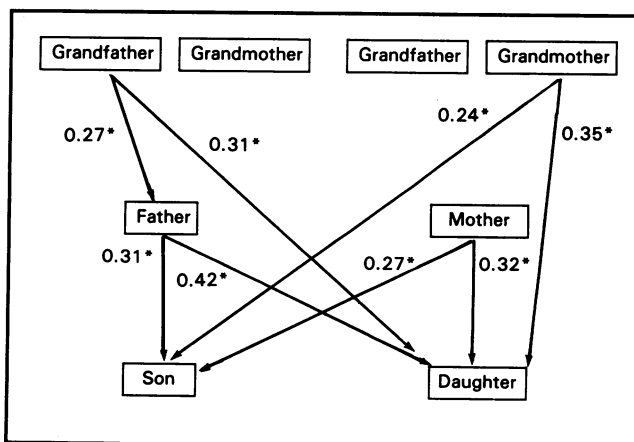


Figure 1. Significant tau-B correlations between family members from three generations for the relative frequency of new episodes of illness per year derived from the period 1945-79 (*P<0.05).

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The results of this study suggest that predictions regarding the frequency of new episodes of illness may be possible for grandchildren using data from their grandparents.

Episodes of nervous disorders

In 1965 two family doctors, the practice nurse, two local district nurses, two local social workers, a psychologist and a sociologist assessed the psychosocial characteristics of these families. These characteristics have now been correlated with the morbidity of the grandchildren. The estimated coping capacity of the grandparents showed the strongest relationship, while no relationship could be established with the quantity of problems the grandparents had to cope with. The assessment of coping capacity is a rather subjective criterion and the number of nervous disorders per year for which the grandparents sought medical help was found to be more objective. Using this as a predictor for the total morbidity of their grandchildren a diagram similar to Figure 1 can be drawn (Figure 2). When compared with Figure 1 it can be seen that the nervous disorders of grandparents are a good predictor of morbidity in the parents and children. The dominating role of the maternal grandmother is very evident.

Nervous disorders of maternal grandmothers seem to predict a high morbidity for their sons in law. This relationship is almost as strong as with their own daughters. Hereditary factors cannot explain this relationship and it supports the thesis that the daughters of parents with nervous symptoms tend to choose similar partners, although the sons in law may develop this illness behaviour under the influence of their wife. Whatever the explanation, nervous disorders give an insight into the transmission of illness and illness behaviour from generation to generation and seem to offer possibilities for prediction of problems.

Prevalence of nervous disorders

The four practices connected with the Institute of General Practice at Nijmegen University, two urban and two rural practices with a population of about 12 000, keep a continuous morbidity register. Nervous disorders appear to account for about 10% of all diagnoses and for 90% of all registered psychiatric morbidity in the population. For a diagnosis of nervous disorder to be made there has to be no evidence of organic pathology (after adequate investigation) that could explain the complaints, and positive evidence of a psychological reason for the disorder.

In the last decade nervous disorder has occupied one of the top five positions in the ranking order of all the diagnoses

for men, and one of the top three for women, usually the first position. The number of diagnoses of nervous disorder increases with age until the age of 40 years, after which it decreases. In all age groups, except those aged four years and under, females are more prone to these disorders than males. Chronic nervous disorders begin to be apparent in puberty and the numbers increase with age. In men the prevalence decreases after 60 years of age, while in women the decrease is later and less evident.

The continuous morbidity register in these four practices enables longitudinal studies of individuals in the population. In a cohort study it was demonstrated that over a period of seven years about half of all adults sought medical help for nervous symptoms at some time. The more often they consulted their general practitioner the more likely they were to be referred to laboratories, X-ray departments, consultants or specialists. The number of other and purely somatic diagnoses also increased for these patients, in particular once a diagnosis of a chronic nervous disorder had been made.

When the reasons for all referrals in the last decade were ranked in order, nervous disorder occupied first place and as a reason for hospital admission third place (only surpassed by childbirth and coronary infarction).

Reasons for nervous disorders

Nervous disorders are supposed to be the result of interplay between nature and nurture, between the constitution of an individual and his external circumstances, and almost everyone suffers from nervous symptoms when the burdens of life are heavy. But what is the main reason for nervous disorders in the average individual in general practice?

In order to answer this question an investigation was carried out in one of the four practices in 1973.¹³ A sample of 106 female patients between the ages of 20 and 60 years with nervous disorders and a random sample of 53 women visiting the surgery for other reasons were asked to complete two questionnaires — the Eisler questionnaire,¹⁴ purporting to measure social stress factors, and the Amsterdam biographical questionnaire¹⁵ (similar to the Eysenck personality inventory), a well-validated test for neurotic instability. The scores of these questionnaires were related to the data for these women recorded in the continuous morbidity register over the period 1971–77. The results showed no relationship between morbidity and the Eisler stress scores but a statistically very significant relationship between the Amsterdam biographical questionnaire personality scores and nervous disorders and all morbidity.

The relationship between the stress and personality scores of these women and the morbidity of their children and husbands was also examined. There were only a few statistically significant correlations between the stress scores of the mothers and the morbidity of their children and these were all in the opposite direction; that is, when the mothers reported less stress they requested more medical help for their children. However, many positive correlations were found between the personality scores of the mothers and the morbidity of their children, particularly in the youngest age groups (up to 10 years). The relationship with the husbands' morbidity was less clear.

All the evidence presented here seems to point to the transmission of somatic and emotional morbidity from generation to generation, primarily from mothers to young children. In this respect the psychological make up of the mother seems to be of utmost importance. Sixty seven of the women were asked to complete the Amsterdam biographical questionnaire again after one year and after five years and only small differences were found. This suggests that this kind of psychological make up is long lasting.

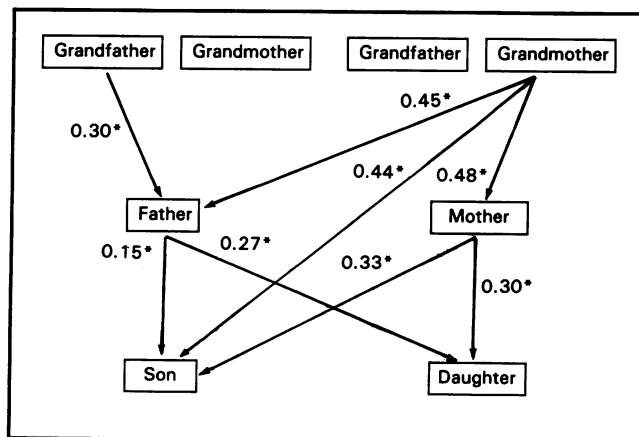


Figure 2. Significant tau-B correlations between family members from three generations for the relative frequency of episodes of nervous disorders per year derived from the period 1945–79 (* $P < 0.05$).

The importance of the family unit

If we want to do anything about this transmission of morbidity we will have to catch patients early in life as we start to learn the meaning and importance of bodily symptoms in early youth. The family is the logical unit to work with.

Some readers will believe that these transmission phenomena can be explained by the differences between families in requesting medical help, which is mostly determined by the mother. However, when all the members of families were interviewed separately even stronger correlations were found between family members and especially between mothers and children in the kind and numbers of symptoms experienced for which no medical help was requested.

It appears that even in a welfare state the doctor is only consulted for about 10% of all health problems. This proved to be so not only in other anamnestic investigations¹⁶ but also in a recent investigation using patients' health diaries.¹⁷ Last has coined the term 'iceberg of disease' for this phenomenon¹⁸ and it is important for family doctors to realize that the vast majority of illness and disease is dealt with within the family. When patients come to ask our advice the symptoms and their meaning will probably already have been discussed at home. It is worthwhile asking what has been said about the symptoms and to try and get an impression of their meaning and significance in the patients' environment. It is also worth remembering that what we say and do will be talked about in the patients' homes. We play a role in the family, even when we are not present.

As general practitioners we have frequent contact with patients, in particular with women in the childbearing and childrearing age group who are key figures in family medical care. Over the years we come to know our patients well and can assess their emotional stability and their expectations of medical care. In this way we can spot the families most at risk for the transmission of morbidity from generation to generation.

Stable differences in rates of prescriptions, referrals and hospital admissions have been demonstrated to exist between neighbouring practice populations over several years, after correction for age and sex.¹⁹ This makes it highly likely that family doctors can have a considerable influence on the medical history of the families in their practices.

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