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Time Trends in Peptic Ulcer Surgery in Sweden

A preliminary report of a nation-wide survey

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ABSTRACT

In order to establish time trends in surgical rates for peptic ulcer disease, we sent a questionnaire to every surgical department in Sweden. Eighty-two per cent of the departments responded. Since 1956 there was a marked and steady decline in elective procedures (- 83%) and to a much lesser extent also in emergency procedures for perforations (- 30%). The decline was most pronounced for duodenal ulcer in men. In 1986, the incidence was 1.2 and 0.65 operations per 10 000 inhabitants for elective and emergency operations, respectively. In the future, the few patients needing elective surgery for peptic ulcer may have to be served by a small number of specialized centers.

INTRODUCTION

During the past hundred years there has been a marked change in the epidemiology of peptic ulcer disease. In the 19th century duodenal ulcer was a rarely encountered disease. During the first half of the 20th century the prevalence rose to several times that of gastric ulcer. But, starting from the 1950s, the rise in duodenal ulcer incidence seems to level off and there are now even some indications that the disease is becoming less common (1). According to mortality statistics and hospital admission rates the decline in peptic ulcer incidence is especially marked for duodenal ulcer in men (1). However, mortality statistics and hospital admission rates may not directly reflect disease activity in a population.

As expected, the decrease in admittance rates is accompanied by decreasing surgical rates. As demonstrated in Rochester, MN, there was a marked decline in elective operations for peptic ulcer over the last three decades, whereas the rates for emergency operations remained virtually unchanged (2).

The aim of this study was to extend the findings from the local population of Rochester, MN, to the entire Sweden, and to shed light on possible reasons for the changing pattern of ulcer surgery. Sweden, where public health care accounts for all in-patient surgery and where each individual resorts to his local county hospital, offers unique opportunities for extended studies of surgical trends in a large and clearly defined population.

MATERIAL AND METHODS

We asked all surgical departments in Sweden for information on the number and sex distribution of elective and emergency operations for gastric and duodenal ulcers performed in 1956, 1966, 1976 and 1986, respectively. Exact figures, not only estimated figures, from the local registries were required for acceptance into the analysis. The questionnaire also included questions on surgical policy with regard to indications for surgery and choice of surgical procedures in different situations.

RESULTS

We received valid information concerning ulcer surgery in 1986 from 71 of the departments (82 %) with a total catchment area of 6.8 million inhabitants (81% of the Swedish population). Exact figures for the number of elective and emergency operations during all of the four years under study (1956, 1966, 1976, 1986) were obtained from 42 hospitals representing a population of 3.8 million.

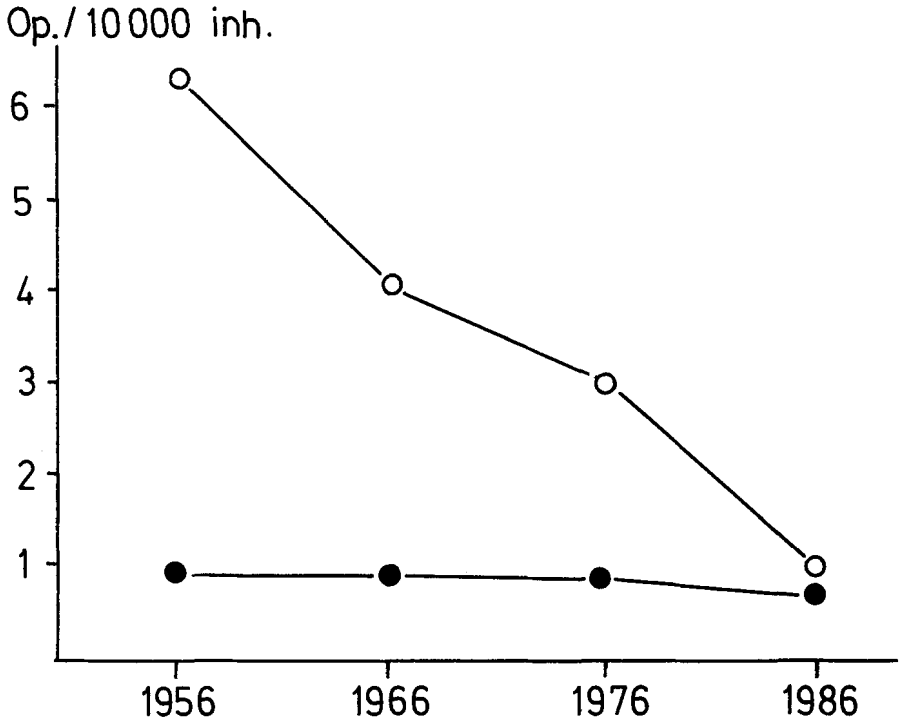

Fig.1. Surgical rates for elective (o) and emergency (•) operations for peptic ulcer disease in a population of 3.8 million inhabitants. The data have not been corrected for the gradual increase (10%) in population in Sweden between 1956 and 1986.

In the years 1956, 1966, 1976 and 1986 the number of elective procedures in the population of 3.8 million inhabitants were 2452, 1552, 1134 and 424, respectively. Thus the rates have fallen steadily during the four years under study (Fig 1). The rate declined both for duodenal and gastric ulcers. For duodenal ulcers the decrease was particularly marked for men and the male/female ratio fell from 4.6:1 in 1956 to 1.5:1 in 1986.

The number of operations for perforation in the 42 hospitals covering 3.8 million inhabitants were 360, 296, 295 and 252 in 1956, 1966, 1976 and 1986, respectively. Thus the decline in operations for perforation was much less than for elective procedures (Fig 1). A linear regression analysis of the data from 1986 revealed that there

was no statistically significant correlation between rates of elective surgery and number of operations for perforation at the different hospitals.

In 1986 a total number of 762 elective operations for peptic ulcer were performed in the 71 hospitals serving 6.8 million inhabitants, thus giving a rate of elective operation of 1.2 operations per 10 000 inhabitants. The elective surgical rate varied ten-fold between hospitals without any distinct pattern with regard to geographical location, size or type of hospital. The 762 elective procedures were performed by a total number of 328 surgeons. Thus the mean number of elective operations for peptic ulcer per surgeon was only 2.3 per year.

We also asked for opionions regarding to choice of surgical procedures in different types of peptic ulcer. For duodenal ulcers 93 % of the responding surgeons declared that highly selective vagotomy was their routine procedure in uncomplicated cases. With very few exceptions gastric ulcers were treated by gastric resection preferrably with reconstruction according to Billroth I. Half of the surgeons recommended resection with or without vagotomy for prepyloric ulcers while the other half recommended highly selective vagotomy.

DISCUSSION

Before drawing any conclusions from the present data, some comments regarding the validity have to be made. The information was obtained by sending questionnaires to the heads of every surgical department in Sweden. They were asked to extract the requested data from their own registries. There is of course a risk of negligence, but our impression is that the questionnaires have been filled in with great care. Moreover, only exact figures were accepted in the analysis. Although this is only a preliminary report and formal validity checks are yet to be done, we are confident that registries over surgical operations are well-managed, making misclassification as a major source of error highly unlikely.

A non-response rate of 18 % may be a matter of concern. By analysing type, size and geographical location of non-responding hospitals we found no specific differences in comparison with responding ones. Thus we do not believe that the non-response has introduced any systematic bias. On the other hand it is possible that the surgeons in charge of the non-responding units were less

interested in peptic ulcer surgery than were their collegues in the responding departments.

The missing historical data may also have introduced bias. However, no systematic difference emerged when we compared the figures from 1986 derived from those departments that presented a complete record for the four years under study, with those from departments that did not. Thus, although the historical data stem from a catchment area accounting for only half of the total population, we have found no evidence against their being representative of the entire population. Another index of validity is the striking similarity with the Rochester data (2).
We have not undertaken any correction for the slow increase in the total population of Sweden. However, this increase is only about 10% between 1956 and 1986. A correction would have made the falling trends even somewhat steeper.

There are good reasons for putting particular emphasis on trends in ulcer perforations, which probably reflect ulcer epidemiology better than elective surgery. Firstly, it is reasonable to assume that perforations occur at random among those at risk, i.e. those with active ulcers, and that perforations thus might serve as an index of ulcer prevalence. Secondly, since almost every individual with a perforation is admitted to hospitals, an iceberg effect is improbable. Thirdly, the dramatic clinical presentation almost inevitably leads to a firm diagnosis, making misclassification a minor problem. The absence of a positive correlation between rates for elective procedures and perforations indicates that there are no geographical areas with higher incidence of peptic ulcer disease. If such areas existed one would expect that a large number of elective procedures would be coupled to a large number of perforations, thus giving a positive correlation. Absence of a negative correlation indicates that an active elective surgical policy does not protect a population against ulcer complications such as perforation. We also think it is highly unlikely that both mechanisms could be in operation at the same time and balance each other out completely.

We conclude that there has been a dramatic decline in peptic ulcer surgery in Sweden starting long before the advent of fiberoptic endoscopy, H_2-receptor antagonists and highly selective vagotomy. The falling incidence of perforations (-30%), suggests that the ulcer prevalence (or possibly severity) has changed, but not as dramatically as would be suggested by the marked decrease in total admittance rates.

The much greater reduction of elective surgery (-83%), on the other hand, indicates that altered strategies for surgery plays an important role as well.

The small number of elective operations for peptic ulcer disease that will remain in the future, poses great emphasis on surgical training and organisation of surgical care in general. It seems reasonable to serve the few patients that need elective surgery at specialized centers.

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