Mortality After Successful Percutaneous Transluminal Coronary Angioplasty in Patients 75 Years of Age and Over

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This study evaluated long-term mortality after successful percutaneous transluminal coronary angioplasty (PTCA) in elderly patients and compared the results with those obtained in a control group of younger individuals matched for sex, symptoms of coronary heart disease (CHD), and severity of disease.

STUDY GROUP AND FOLLOW-UP

From 1980 to 1990, a total of 6830 patients underwent PTCA at a hospital in Nieuwegein, Netherlands. Of these, 212 patients were >75 years old, and successful PTCA (residual stenosis of <50%) was achieved in 192. This group was prospectively followed for a mean of 23.3 ± 21 months (range, 0–81 months), and the mortality of this group was compared with that of a control group of persons aged 40 to 65 years, matched for gender and severity of CHD symptoms and disease. Individuals who had complications of death, emergency coronary artery bypass graft (CABG) surgery, or myocardial infarction after PTCA were excluded from the study group.

Total mortality is shown graphically in Figure 1 of the original article.

This mortality abstract is based on the survival curve for the 192 patients 75 years old or older. The mean age of this group was 77.6 years (range, 7–84 years); 64.6% were men. The number alive at the beginning of each yearly interval (I) is indicated beneath the survival curve.

This mortality abstract compares the survival of the older age study group to that of
a similar age group in the general population. Therefore, the younger study group in the article was not evaluated for this abstract.

EXPECTED MORTALITY

The 1985–90 population table for the Netherlands was used as the source of expected mortality data in Table 1. Because the range of ages of participants was <10 years, the mean age selected for the initial annual interval mortality rate (q') was 78. The subsequent mean ages chosen increased by 1.0 year annually (ie, 79, 80, 81, and 82). Mortality rates for all annual intervals were weighted proportionately for the percentage of men and women (64.6% and 35.4%, respectively).

DERIVATIONS

Using the number alive at the beginning of each yearly interval (l) and estimated observed mortality (q) derived from cumulative survival (P) and interval survival (p) in the graph, 2 simultaneous equations were solved for 2 unknowns. In this way it was possible to arrive at estimations for interval observed deaths (d), withdrawals (w), and, subsequently, exposure (E). E was then used to estimate expected deaths (d').

RESULTS

The authors concluded that survival after successful PTCA was worse for elderly individuals than for younger individuals with similar degrees of CHD severity. However, neither the older nor the younger study group was compared with an age-matched population for determination of comparative mortality ratios. Because of the many potential differences between the older and younger study groups (eg, physical function), this mortality abstract does not attempt to compare the survival of the 2 age groups and instead focuses solely on the older age group.

By comparing the mortality curve results to general population mortality rates, this study suggests that successful PTCA in individuals >75 years old does not increase
mortality and may, in fact, decrease it. Arguably, a degree of "selective survival" is almost certainly evident in those who survived both the presentation of CHD (41% underwent emergent PTCA) and invasive interventional therapy for it.

COMMENTS

This study and the mortality estimates are limited in several ways. The authors did not provide the specific number of total deaths. The estimated deaths are quite low, estimated withdrawals are quite high, thus limiting the usefulness of these derivations. Because only individuals judged to have had "successful" PTCA procedures were followed, there was an element of selection in the patient population. To that end, using group insurance mortality tables may have yielded more accurate mortality ratios by assuming lower expected mortality rates. Although the percentages of men and women were provided for the entire group, it is likely that the female participants were older on average. This may have skewed the weighted expected mortality rates used.

Although immediate perioperative deaths were excluded, relatively early postoperative deaths in the first 30 days were not excluded. It is interesting to note, therefore, that the slope of the survival curve in the first few weeks to months after PTCA does not appear to differ appreciably in comparison with the slope in later months. Tabular data provided by the authors would be expected to give more accurate results regarding early postoperative mortality, by age and gender subgroups, than estimates measured from the graph alone.

The estimated expected deaths fell within both the 90% and 95% lower confidence limits of the Poisson distribution tables, suggesting that the number of observed deaths was not significantly different from those expected in the population.

However, because it considered the survival of only those older individuals who underwent successful PTCA, this study provides some reassurance for the practice of offering life insurance to elderly applicants with CHD.

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