Left-handedness and Mortality

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ABSTRACT

We examined mortality associated with handedness in two ways. A simulation using national data suggests that lower mean age at death among left-handed persons, previously offered as evidence of higher mortality, can be explained exclusively by the age distribution of laterality. Second, empiric evidence from a 6-year cohort study of 3774 older adults from East Boston, Massachusetts, demonstrates that left-handedness is not associated with mortality (relative odds = 1.04, 95% confidence interval = 0.79, 1.36). (*Am J Public Health.* 1993;83:265–267)

Introduction

In a retrospective study of decedents, the average age at death of left-handers was 9 years lower than that for right-handers.[1] The authors' conclusion that left-handers are at greater risk of death was roundly criticized based on poor response rates and possible recall bias by next-of-kin respondents.[2] Comparing the mean age at death involves only the numerator, not the underlying population at risk, and thus does not entail a comparison of mortality rates.[3] Failure to account for potential cohort differences in a cross-sectional analysis can lead to profoundly biased results.[4] Left-handedness decreases from 13% in the third decade of life to less than 1% in the ninth decade.[5] Rather than selective survival, decreasing societal pressure on more recent generations of left-handers to change their handedness may explain the current age gradient in handedness. We conducted a national simulation and analyzed a cohort study of older adults to examine the relationship of handedness and mortality.

Methods

We applied age-specific rates of handedness[5] to the 1988 US population[6] to estimate the number of right- and left-handed persons aged 5 years and older. Assuming no difference in mortality rates according to handedness, we applied US age-specific all-cause and injury mortality rates[7] to both groups. Mean age at death was estimated using the midpoint of each decade (e.g., 10, 20, etc.).

We also analyzed data from the East Boston site of the Established Populations for the Epidemiologic Studies of the Elderly, a longitudinal study begun in 1982 of men and women aged 65 years and older.[8] We classified subjects as right-handed if they reported using their right hand for both writing and cutting with scissors and as left-handed if they used their left hand or either hand for either task; this definition is comparable to that used in prior work.[1,5] Initial interviews were completed with 3809 subjects (84% of the eligible respondents); 35 respondents with missing data on handedness at baseline were excluded. Six years of vital status follow-up were available for all subjects. We used logistic regression to estimate the relative risk of death associated with handedness over 6 years, controlling for age at baseline and sex. A Weibull regression model,[9] which additionally accounted for the exact date of death, obtained similar results.

Results

Left-handers are a younger-aged population than right-handers (Figure 1). Because of the paucity of older left-handers, it was estimated that less than 15% of left-handed deaths occur at ages 75 and older, compared with more than 50% of right-handed deaths (Figure 2). Applying identical age-specific mortality rates to the right- and left-handed populations, the mean age at death estimated from the national data was 72 years for right-handers and 58 years for left-handers. Separate analyses for males and females also showed 14-year differences in mean age at death. The percentage of deaths due to injuries in left-handers was more than twice that of right-handers, again due to left-handers' younger age distribution.

In the East Boston aged cohort, left-handedness was not related to age (age 65 to 74, 6.9%; age 75 to 84, 7.3%; age 85 and older, 7.3%); however, men were significantly more likely to be left-handed than women (9.1% vs 5.8%, $P < .001$). Crude 6-year mortality rates were not significantly different: 32.2% among right-handed subjects and 33.8% among left-handed subjects. After adjusting for age and sex, left-handedness was not related to mortality in a logistic regression model (relative odds = 1.04; 95% confidence interval = 0.79, 1.36).

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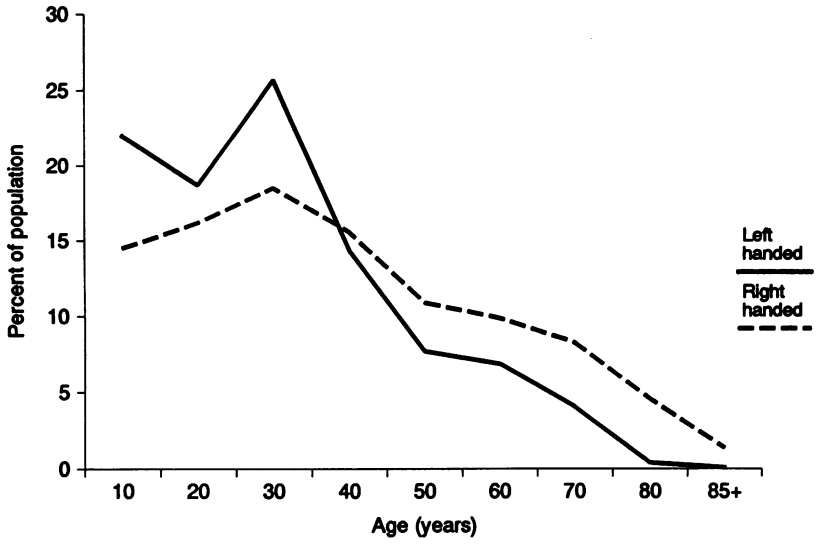
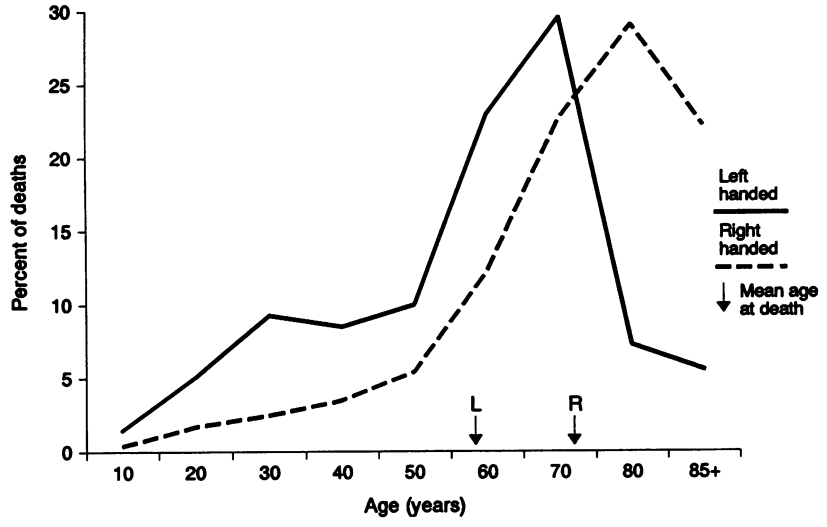


[a]Calculated by multiplying age-specific rates of handedness[5] and the US Census Bureau population estimates for 1988.[6]

FIGURE 1—Estimated age distribution of left- and right-handed persons, United States, 1988.[a]



[a]Assuming no difference in mortality rates by handedness. Calculated by applying US age-specific mortality rates[7] to the right- and left-handed population estimates from Figure 1.

FIGURE 2—Estimated distribution of deaths according to handedness for ages 5 and older, United States, 1988.[a]

Discussion

The simulation, which assumed no difference in mortality between right- and left-handed persons, demonstrated that substantial differences in mean age at death may be explained exclusively by the age distribution of laterality in the population. The relative lack of left-handers at the oldest ages explains the reported lower mean age at death for all left-handed decedents compared with that for right-handed decedents. Lower mean age at death in left-handers implies nothing about their *risk* of death.

To be informative, the data of Halpern and Coren on handedness among decedents in Southern California[1] would require complementary denominator information (obtained, e.g., from a population survey) on the age-specific prevalence of handedness in the general population. Only with this information could rates of mortality for left- and right-handed individuals be compared.

Divergent explanations have been offered for the decline in left-handedness with increasing age, including differential mortality[1,10] or substantial age and cohort effects.[11] These conflicting interpretations are clouded, however, by the different definitions of handedness used over the years, the diverse populations surveyed in terms of age and geographic and cultural characteristics, and the failure to consider possible confounding. Thus, the historical data have only limited value in evaluating reasons for the decline of left-handedness with age. Results of this study and others[12–14] cast doubt on differential mortality as the explanation for the current population distribution of handedness.

The earlier report that left-handed persons are at higher risk of nonfatal injury[15] did not present mortality follow-up according to laterality and thus does not bear on this issue. Left-handers are a younger-aged population, and it is well established that a greater proportion of deaths at younger ages are injury related.[7]

Our prospective analysis found no evidence of increased mortality in left-handers in the population aged 65 and older, which suffers 72% of all deaths.[7] Strengths of these data include the uniform assessment of handedness at the beginning of the study in the entire cohort; the prospective design, which avoids recall bias; and the high participation by a population-based cohort. East Boston elders had a relatively constant prevalence of left-handedness by age, which may arise either because there is no younger comparison group or because age-related changes in handedness occur before age 65. Our mortality findings are consistent with reports from the Framingham study[12] and the 10-year results from the National Health and Nutrition Examination Survey (NHANES) I–Epidemiologic Followup Study,[13] two studies that examined younger subjects; our findings conflict with the reported *lower* left-handed mortality in the 13-year NHANES follow-up study.[14] Taken together, the cohort studies, including the present results, strongly suggest that left-handedness is not associated with an elevated risk of death. □

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The Effect of Fish Oil Supplements on Blood Pressure

ABSTRACT

We conducted a double-blind, placebo-controlled crossover study to determine the effects of fish oil supplementation on blood pressure in middle-aged men. Subjects were randomly assigned to consume either 20 g of fish oil or safflower oil for 12 weeks and then consume the other oil for an additional 12 weeks after a 4-week washout period. We found no significant changes from the pretreatment value in systolic or diastolic blood pressure with the use of fish oil supplements. In addition, there were no significant differences in the post-treatment blood pressures comparing the fish and safflower oil phases of the study. (*Am J Public Health.* 1993;83:267–269)

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Introduction

Recently, there has been considerable interest concerning the potential cardioprotective effect of consuming fish oil supplements containing high quantities of omega-3 polyunsaturated fatty acids.[1–3] It has been postulated that consumption of fish oil may reduce blood pressure by altering prostaglandin synthesis.[2,3] The initial studies on the effect of fish and fish oil consumption on blood pressure have produced mixed results.[4–8] A meta-analysis of the initial randomized trials failed to show a significant antihypertensive effect of consuming fish oil supplements.[9] As part of a double-blind randomized crossover trial of fish oil supplementation and cholesterol,[10] we had the opportunity to examine the effect of fish oil on blood pressure in a group of middle-aged hypertensive and normotensive men with hypercholesterolemia.

Methods

Participants were recruited at the Minneapolis Veterans Affairs Medical Center as part of a randomized double-blind, controlled, two-period crossover study investigating the effects of fish oil on serum cholesterol.[10] Participants were excluded if they were greater than 60 years old or had significant comorbid conditions. Individuals were designated as hypertensive if their mean diastolic blood pressure on three readings during the initial evaluation was greater than 90 mm Hg. Individuals were designated as normotensive if their initial mean diastolic blood pressure was 90 mm Hg or less and they were not receiving antihypertensive medications.

Blood pressure was measured at the right brachial artery in seated subjects using a mercury gauged sphygmomanometer. Blood pressure was measured at the initial visit (week −4) and at weeks 0, 12, 16, and 28. The mean of three readings

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