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Research Letters

Lives of the artists: differences in longevity between old master sculptors and painters

SIR—*If people knew how hard I worked to get my mastery, it wouldn't seem so wonderful at all.*

Michelangelo

The historical record of the old master European painters and sculptors is well documented. Giorgio Vasari published the biographical history of Italian artists 'Lives of the Painters, Sculptors, and Architects' in 1550 [1] while Carel van Mander's 'Schilderboeck', the classic study on Dutch and German artists, was published 54 years later [2]. These publications provided biographical information on the artists as well as discussing their important artistic output. From these initial biographies and extensive art historical research, the lives of important European old master artists are as well documented as any occupation from the Renaissance to modern times.

Approximately 500 years after the birth of Raphael and Michelangelo, Paffenbarger and colleagues studied the mortality rates of longshoremen working on the docks of San Francisco [3, 4]. Longshoremen working as cargo handlers had a decreased mortality when compared to workers with a less vigorous workload. The strength of the study was the control group, individuals with seemingly the same ethnic and economic background but assigned to a lighter workload. The decrease in mortality was documented to be a result of a lower incidence of cardiovascular disease, the leading cause of death in America in the 1970s [3, 4]. The question arises whether old master sculptors had a longer lifespan when compared to their painter counterparts since the sculpting of stone expends more energy than applying tempera and oil to canvas or wood.

Methods

A database of European old master painters and sculptors was created based on artists listed in two reference texts, 'Larousse Dictionary of Painters' [5] and the 'Encyclopedia of Sculpture' [6]. Michelangelo was the only artist listed in both texts; since he considered himself a sculptor, not a painter, he is classified as such. The birth year and year of death were taken from the two texts (for five artists, these dates have been changed as a result of modern scholarship). For certain artists, the year of birth or death is not exactly known, but has been narrowed down to a 2-year interval. In this instance, the year chosen for painters resulted in an increased lifespan, while for sculptors the year chosen resulted in a shorter lifespan. The manner of death, obviously known for some artists such as Vincent Van Gogh, was not a criterion for exclusion from the database. Women artists, a total of six, were included in the database. The sculptors selected must have some documented work in stone; those working solely in bronze, clay, or stucco were excluded from the database. If either the birth year or year of death was not narrowed down to a 2-year period, the artist was excluded from the database. Artists who lived in the twentieth century were not included in the analysis. The total number of painters that met these criteria was 262, and sculptors numbered 144. Any errors in these birth and death records should be distributed equally between the two groups.

Statistical analysis of the data was performed with NCSS 6.0 Statistical Systems for Windows (Kaysville, UT). Mean age at death and standard error of the mean are provided for the whole group and specific sub-groups. Multiple regression analysis was used to ascertain the probability level for the hypothesis that the artists' profession significantly influenced their lifespan and differences between painters and sculptors when grouped by age at death or by country of birth. Statistical significance was set at $P<0.05$.

Results

Analysis of the database revealed that painters lived 3 years less than sculptors (63.6 ± 0.9 versus 67.4 ± 1.1). This difference in mean age proved to be statistically significant ($P<0.01$). The average age of these artists is similar to Italian Renaissance masters as compiled by Berenson [7]. The differences in the median age and modal age at death were 4 and 5 years respectively. When the data were plotted as a frequency histogram of the age at death of both painters and sculptors (Figure 1), painters were much more likely to die before the age of 40 than were sculptors (9.1 versus 2.7% of the population), while substantially more sculptors lived into their eighties (21 versus 13% of the population). Sixty percent of the painters versus only 48% of the sculptors died prior to the age of 70. While these differences failed to attain statistical significance, they do explain the difference in mean age at death between sculptors and painters. When the artists were classified by country of birth (Table 1), differences in mean age at death between painters and sculptors were observed in many countries; Dutch, English, German and Italian artists each mirrored the differences in mean age of death observed between all sculptors and painters. The differences between sculptors and painters in the various countries were found not to be statistically significant. Artists, from 11 countries, are classified as other; the increased longevity of sculptors was not found in this diverse population. Finally, an analysis was conducted on artists whose age at birth or death is not documented within

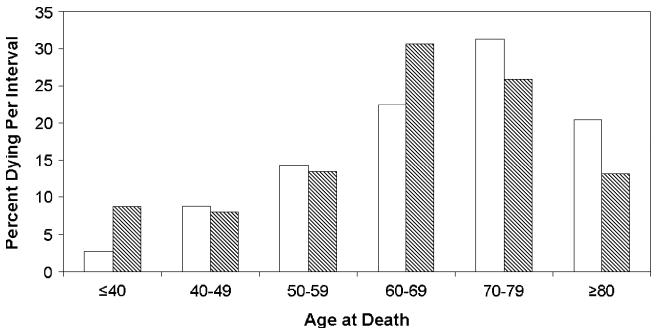

Figure 1. Age at death of old master painters and sculptors. The open bars represent sculptors and the hatch bars represent painters.

Table 1. Age at death of old master sculptors and painters from various nations

Country	Painters	Sculptors
Italy	63.9 ± 2.1 (73)	68.1 ± 2.0 (51)
France	65.8 ± 2.1 (52)	67.9 ± 2.1 (39)
Netherlands	60.9 ± 2.3 (40)	67.7 ± 2.8 (8)
England	62.8 ± 2.3 (36)	69.8 ± 3.9 (13)
Germany	61.1 ± 3.7 (20)	71.6 ± 5.3 (7)
Other	64.7 ± 2.0 (41)	63.1 ± 2.5 (26)

Results represent mean ± S.E.M. The number of artists from each country is in parentheses.

a 2-year period. Artists with an estimated lifespan, consisting of 68 sculptors and 94 painters, died at the mean age of 63.1 and 58.8 years, respectively. This difference was also found to be statistically significant ($P<0.034$).

While the caloric expenditure of stone sculptors has not, to the best of our knowledge, been documented, the energy expenditure of a wide variety of activities has been established [8]. The activity of sculpting stone with hammers and chisels can be compared to jobs such as masonry and light axe work. The caloric expenditure of these professions is increased 5–7-fold above resting values of about 0.083 kJ/min/kg (0.02 kcal/min/kg), and averages 27.2–38.1 kJ/min (6.5–9.1 kcal/min) based on a 65 kg individual [8], similar to cargo handling longshoremen [3, 4]. Painters can be compared to standing arts and crafts workers whose moderate activity increases resting caloric expenditure 1.8 to 3-fold, or approximately 9.8–16.3 kJ/min (2.3–3.9 kcal/min), which is in the same range as longshoremen having jobs with lighter workloads [3, 4].

Discussion

While cargo–handling longshoremen and sculptors live longer when compared to their control populations, their work-related exercise must have affected different disease states. In the period Paffenbarger and colleagues studied longshoremen, coronary heart disease was the leading cause of death in the United States [3, 4]. An explanation for the significant difference in the age of death between sculptors and painters must also address the leading cause of death in Europe prior to the twentieth century, that being infectious diseases [9]. There are many possible explanations for the difference in longevity between sculptors and painters. Differences in their diet, social class (reflecting their place of residence) and even cause of death may contribute to the difference in longevity. Working with toxic materials could be a partial explanation, with solvents and heavy metals in paints for painters and stone dust producing silicosis for sculptors. Unfortunately, these possible differences cannot be ascertained for all 406 artists. One intriguing possibility in explaining the mortality difference between sculptors and painters is the effect of moderate exercise on the immune system, which affects both cardiovascular mortality and death due to infectious diseases. Moderate exercise decreases several of the immune processes thought to be important in atherogenesis. Reduction in the inflammatory cytokine cascade has been observed with exercise [10]. Circulating levels of C-reactive protein, a marker of overall systemic inflammation, are decreased by exercise [11]. Therefore, the decrease in cardiovascular mortality in hard-working dockworkers can be attributed, to some extent, to an amelioration of a chronic inflammatory condition.

Similarly, the difference in mortality rates between sculptors and painters can be attributed to the result of moderate exercise on the immune system. Moderate exercise increases humoral immunity. In mice, moderate exercise has been associated with increased B-cell response and prolonged half-life of circulating IgG [12]. In humans, exercise improves the antibody response upon immunisation for influenza [13] and decreases the susceptibility to upper respiratory tract infections [14]. In addition, moderate exercise has been shown to ameliorate the age-related decline in T-cell function and innate immunity [15]. These observations suggest that prior to the advent of antibiotics, exercise may have been one of the few interventions protecting individuals from infectious disease mortality. Finally, it should be also noted that three of the great Greek sculptors of classical antiquity, Polykleitos, Praxiteles and Skopas, are reported to have lived long lives; the average age at death for these sculptors was reported to be 71 years [6].

Key points

- Old master sculptors lived 3 years longer than old master painters.
- A difference in longevity between sculptors and painters was not related to geographical location.

Conflicts of Interest Declaration

There are no conflicts of interest.

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Predictors of two-year mortality in nonagenarians with severe functional impairment at baseline: the NonaSantfeliu study

SIR—The demographic importance of the very elderly population is increasing. Few studies have prospectively evaluated predictors of mortality in nonagenarian cohorts [1–4]. Such predictors seem to change over time in the oldest of the old [5] and several known predictors, such as socio-demographic factors, smoking or obesity, have lost their importance. However, a high disability level, poor physical performance and poor cognitive performance may predict mortality, as shown in a study with a 15-month follow-up [6].

The proportion of subjects with functional dependence, as measured by activities of daily living (ADL), increases with age [7]. Indeed, high disability level is known to be a good predictor of mortality, even in nonagenarians [1]. Nevertheless, there is a lack of information about predictors of mortality in nonagenarians who already have poor ADL capacity at baseline.

In this 24-month study, we examined the contributions to total mortality made by physical and cognitive function and clinical and socio-demographic characteristics. The cohort was a group of selected nonagenarians with poor functional status at baseline.

Methods

The data were taken from the NonaSantfeliu study, a population-based study of 186 nonagenarian inhabitants of Sant Feliu de Llobregat (Barcelona, Spain). The sample has been described in detail elsewhere [3, 8]. There were no exclusions due to health criteria, cognition or dwelling status (community or institutionalised). The institutional ethics committee approved the study. All patients, or the caregivers of cognitively impaired subjects, gave their written informed consent prior to enrolment. After 24-months, 10 participants could not be assessed as they had moved to another city and could not be followed-up. The participants were interviewed at their home, rest home, or health centre by a geriatric-trained research team. A proxy responder was encouraged to participate in the interview if the nonagenarian was unable to participate due to mental or physical handicaps.

Socio-demographic data (gender, marital status, place of residence, educational level) were recorded. Functional status was measured using the Barthel Index (BI) [9] for basic ADL and the Lawton and Brody Index (LI) [10] for instrumental ADL. Cognitive function was measured by the Spanish version of the Mini-Mental State Examination (MEC) [11], which gives a score out of 35 (a score below or equal to 23 indicates cognitive impairment). The Charlson Index was used to measure global comorbidity [12]. Our investigation placed special emphasis on a diagnosis of hypertension, diabetes mellitus (DM), dyslipidaemia, ischaemic cardiopathy, heart failure, chronic obstructive lung disease (COLD), atrial fibrillation, anaemia, a previous history