

Abstract 39

Gender Differences in Longevity and Sympathovagal Balance

Edward Pereira, MD; Scott Baker, MD; Robert Bulgarelli, DO;
Gary L. Murray, MD; Rohit R. Arora, MD; and Joseph Colombo, PhD
Ansar Medical Technologies, Inc., Philadelphia, PA

Background: Female longevity is not yet understood. Aging is associated with progressive decline in autonomic (parasympathetic and sympathetic, or P&S) function. The decline in the absolute levels of P&S function seems similar for both female and males. Holter monitoring studies suggest that the relative levels of P&S activity differ between the genders. Geriatric females demonstrate more parasympathetic activity relative to sympathetic activity than do age-matched males. This study considers the sympathovagal balance (SB) for female and male by age group to further investigate the dichotomy found in the Holter data.

Methods: Autonomic assessment of more than 5,000 patients, age 65 years or older was performed (ANX 3.0, ANSAR Medical Technologies, Inc., Philadelphia, Pennsylvania). P&S monitoring analyzes the two independent, simultaneous respiratory and HR variability activity signals to measure P&S activity. After omitting patient records with high-quality arrhythmia, 4,911 patients remained (3,007 females, average age = 73.6 ± 5.9 years). These patients were not screened for comorbidities or numbers

of comorbidities. SB is defined as resting sympathetic activity over resting parasympathetic activity (S/P). "Perfect" SB is 1.0. The normal range of SB is $0.4 < SB < 3.0$. Therefore, there are at least four logical ranges for SB: (1) *high*, $SB > 3.0$, indicating sympathetic excess (SE); (2) *low*, $SB < 0.4$, indicating parasympathetic excess (PE); (3) *high-normal*, $1.0 < SB < 3.0$, indicating more sympathetic activity, and (4) *low-normal*, $0.4 < SB < 1.0$, indicating more parasympathetic activity.

Results: No one survived beyond 85 years of age with *high* SB (> 3.0). No males survived beyond 85 years with *high-normal* SB (> 1.0) or *low* SB (< 0.4). Only males with *low-normal* SB ($0.4 < SB < 1.0$) survived beyond 85 years, with some surviving into their mid-90s. Females with *low* SB survived longer than those with *high* SB, some living into their late 80s. Females with *high-normal* SB survived even longer, some living into their early 90s. Females (similar to males) with *low-normal* SB survived the longest, into their late 90s (**Figure**).

Conclusion: Holter data indicate that geriatric females demonstrate more parasympathetic activity relative to sympathetic activity than do age-matched males. However, Holter data cannot differentiate normal levels of parasympathetic activity from PE. Low-normal SB appears to correlate ($P < .001$) with greater longevity, and as shown elsewhere, reduced morbidity and mortality leading to reduced medication load and hospitalization. Gender differences in longevity are associated with autonomic function.

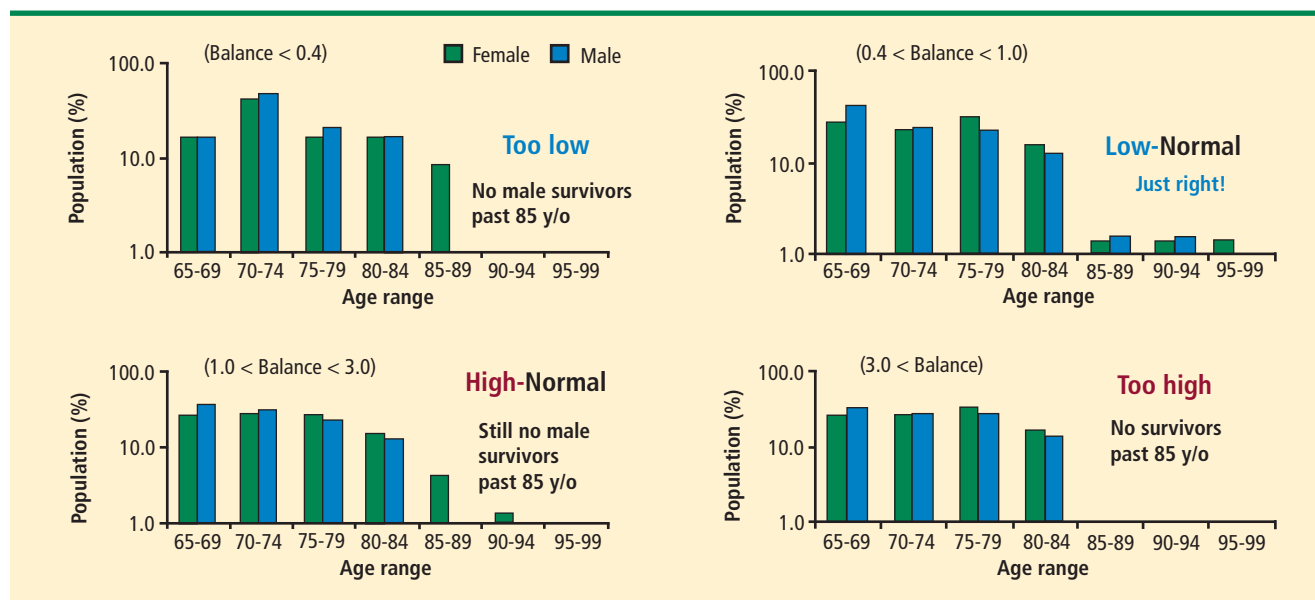


FIGURE. Gender differences.