

## Abstract 39

### Gender Differences in Longevity and Sympathovagal Balance

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**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 =  $73.6 \pm 5.9$  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.

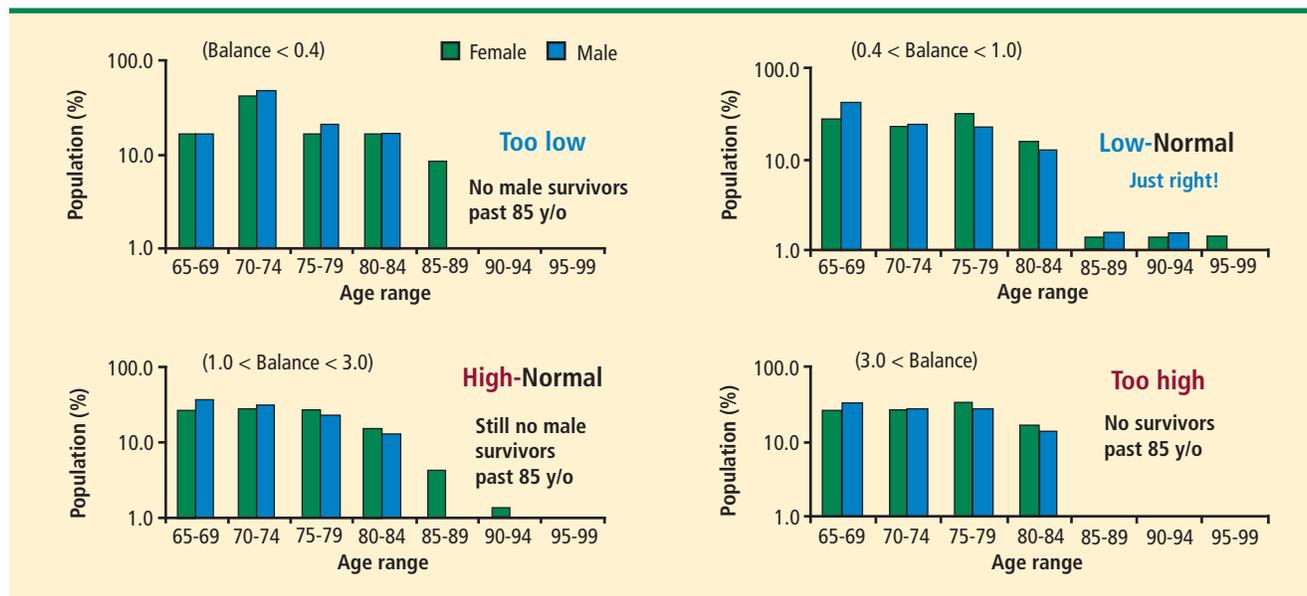


FIGURE. Gender differences.