Persistent Chest Pain Predicts Lower Duke Activity Status Index (DASI) Scores in the Women's Ischaemia Syndrome Evaluation (WISE) Study

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Background: Angina or chest pain is known to be associated with lower Duke Activity Status Index (DASI) scores. While all participants have angina in the Women's Ischaemia Syndrome Evaluation (WISE) study, not all have persistent chest pain (PChP), defined to be pain above the waist at baseline and at 1 year follow-up. Previous research has shown an association between PChP and risk for major adverse cardiac events (MACE). We investigate whether PChP is furthermore associated with greater declines in DASI scores over the course of the first year.

Methods: The population observed in the WISE study consisted of 744 women who had a 1 year follow-up evaluation, 421 of whom did not have PChP and 323 who did have PChP. Unadjusted and adjusted linear regression (see Table 1) on the difference in DASI from baseline to 1 year follow-up was performed, with PChP as the main predictor variable. Assumptions for normality were checked using histograms and normal probability plots and constant variance and linearity was checked with residuals versus fitted plots. Bootstrapping was also used as a nonparametric alternative to estimate the effect of PChP on the difference in DASI scores. The difference in DASI scores was then categorized (improvement/no change/decline in DASI scores) and an unadjusted and adjusted ordered logistic regression was performed with PChP as the main predictor variable. In addition, ordered logistic regression was performed on DASI scores at 1 year follow-up as a categorical variable (Poor/Moderate/ Excellent), adjusting for DASI scores at baseline and other baseline covariates. The assumption of proportionality of odds was checked with a formal test. Hospitalizations and MACE between baseline and 1 year follow-up were compared between women with PChP and women without PChP using t-tests.

Covariates	age, BMI, stenosis score, history of MI, history of diabetes, history of dyslipidemia, history of hypertension, history of smoking, and history of depression

Table 1. Covariates Used in Adjusted Models

Results: Women with PChP had a 1.5 greater decline in DASI from baseline to 1 year follow-up compared to women without PChP in the unadjusted model and a 2.1 greater decline in the adjusted model. This was significant in the adjusted model, with a p-value of 0.04, but not in the unadjusted model. In both regression models, the assumption of constant variance was not violated but normality was violated, as seen in histograms and normal probability plots. However, similar results was obtained with bootstrapping, with women with PChP having a 2.1 (confidence interval [-3.1,-1.1]) greater decline in DASI compared to women without PChP, which was a significant difference with a p-value of 0.03. In the ordered logistic regression on the difference in DASI from baseline to 1 year follow-up, PChP was associated with a worse change in DASI by a factor of 0.84 in the unadjusted model and 0.79 in the adjusted model, but these were not significant. On the other hand, after adjusting for DASI at baseline, PChP was found to be a significant predictor of a worse DASI score at 1 year follow-up in an ordered logistic regression by a factor of 0.51, with a p-value <0.0005. When other baseline covariates were adjusted for, PChP was still a significant predictor of a worse DASI score at 1 year follow-up by a factor of 0.45 and a p-value <0.0005. Proportionality of odds was not found to be violated in either case. Angina hospitalizations were found to be significantly more common among women with PChP than women without PChP, with a p-value <0.0005.

Conclusions: PChP was found to be associated with a smaller improvement in DASI scores from baseline to 1 year follow-up as well as worse DASI scores at 1 year follow-up. However, the precise causes for this effect is unclear. While a higher frequency of angina hospitalizations is to be expected for women with PChP, other types of hospitalizations and MACE were not significantly more frequent among women with PChP. Investigating underlying differences between women with PChP and women without PChP may be the source of further research.