Women Take Un-Type A Behavior to Heart

In affairs of the heart, women often differ from men. A new study indicates that personality traits linked to an early death from heart disease may also vary between the sexes.

Research conducted over the past 30 years finds that male heart-attack survivors stand a greater chance of dying from a heart ailment if they display a Type A personality, one bursting with hostility, cynicism, and impatience (SN: 1/23/88, p.53). The converse appears true for women. Female heart-attack survivors who keep a lid on their anger and react slowly to external events prove most likely to suffer fatal heart problems, report Lynda H. Powell, a psychologist at Rush-Presbyterian-St. Luke's Medical Center in Chicago, and her colleagues.

Their investigation, a rare effort to identify psychological and social factors that put women at risk for suffering recurrences of physical disease, appears in the September/October PSYCHOSOMATIC MEDICINE.

"[This study] challenges our current models of psychosocial factors of heart disease that focus on hostility," writes Margaret A. Chesney, a psychologist at the University of California, San Francisco, in an accompanying comment.

Many researchers assume that findings derived from studies of emotions and heart disease among men apply to women as well, Chesney asserts.

Powell and her colleagues studied 83 women enrolled in clinical trials to determine whether altering Type A behavior diminishes heart problems among heart-attack survivors. Participants entered the project in 1978 and ranged in age from 30 to 63. None smoked cigarettes or suffered from diabetes. At least six months had passed since their first heart attack.

In the following eight to 10 years, six women died of heart attacks or coronary complications.

Women with heart disease and un-Type A traits whose aspirations to a traditional, stable family life go unfulfilled appear to face the bleakest survival prospects, according to Powell's group. Participants in their study married and had children in the 1940s and 1950s and apparently did not expect to need extensive education for paid employment. When forced to work outside the home following divorce, death of a husband, or reduction in a spouse's income, they could obtain only low-paying jobs. In the study, women who died of heart disease were more often divorced, worked full-time, lacked a college education, and earned no more than $20,000 per year.

Overall, financial and emotional stress appeared to surge in the absence of an intimate relationship. In these cases, women often tried to suppress their anger, resentment, loneliness, and dissatisfaction, the researchers say.

"For women with coronary disease, this combination of factors may be lethal," Powell and her co-workers contend.

The findings require confirmation in a larger sample, the investigators caution. But a strong link between specific psychosocial measures and the risk of death in a group this size suggests that the same pattern will emerge in further studies, they argue.

Most strikingly, women who died of heart disease displayed an absence of any urgency to finish tasks and expressed no anger or agitation during a stressful interview, Powell's group notes. This antithesis of Type A responses may indicate a tendency to suppress unpleasant emotions, they suggest.

In related evidence, women in the Framingham Heart Study who reported suppressing their anger experienced the highest rate of first heart attacks. This was especially true for those in clerical jobs.

Primate research suggests that social isolation and limited freedom of movement boost heart disease among females, Chesney notes. Female monkeys housed alone suffer four times more extensive coronary atherosclerosis than their counterparts housed in social groups, she points out.

Risks uncovered in women and female monkeys may sometimes apply to male heart-attack survivors, Chesney holds. For some, social isolation or job stress may accompany depression, whereas pervasive hostility may lead others to withdraw from social contacts. Powell's study presents a basis for studying these possibilities, she says. —*B. Bower*

Heavy elements found in interstellar gas

Astronomers for the first time have detected arsenic and selenium in interstellar gas, they report in the Oct. 10 ASTROPHYSICAL JOURNAL LETTERS. Since completing their newly published study, the researchers also have found thallium and lead, the two heaviest elements ever identified in the gas between stars, says team member Jason A. Cardelli of the University of Wisconsin-Madison.

The findings, as well as data on four other heavy elements, stem from Hubble Space Telescope spectra of seven stars. Measuring the abundance of heavy elements in many more regions of space—a goal that a repaired Hubble could more easily accomplish — may offer several insights, Cardelli says. These include a better understanding of the composition and origin of interstellar dust and the link between stellar evolution and interstellar gas. He notes that aging stars generate heavy elements and ultimately dump them into space, where newly forming stars incorporate them.

George Wallerstein of the University of Washington in Seattle calls the new work "just the beginning" of a comprehensive study of the interstellar medium.

The findings bring to eight the number of elements heavier than zinc that scientists have detected in interstellar gas. While the familiar process of nuclear fusion at the core of massive stars generates the lighter atomic species, elements heavier than zinc typically form by a different mechanism, neutron capture. In this process, the nuclei of lighter elements absorb neutrons and undergo radioactive decay, transforming into heavier atomic species.

Supernova explosions produce a flood of neutrons, setting the stage for "fast" neutron capture, in which atoms absorb neutrons more rapidly than they undergo radioactive decay. The smaller supply of neutrons found in the helium shell of bloated, elderly stars known as asymptotic giant branch stars prompts "slow" capture, in which atoms absorb neutrons at a slower rate.

Some heavy elements stem primarily from fast capture, others mostly from slow capture. Thus, their relative abundance in interstellar gas may serve to mark different types of stellar activity, Cardelli says. But he adds that the variety of activity in any one region complicates interpretation of the measurements.

Cardelli and his colleagues identified the elements by analyzing ultraviolet light from two nearby stars with Hubble's Goddard High-Resolution Spectrograph. As the light passes through the tenuous fog of interstellar gas, specific wavelengths get absorbed by particular elements, creating tiny gaps in the observed spectra.

The low abundance of heavy elements produces faint spectra that only the Hubble instrument could discern, Cardelli notes. He and his co-workers previously had used Hubble to discover gallium, germanium, and krypton in interstellar gas. And in the July 10 ASTROPHYSICAL JOURNAL, Lewis M. Hobbs of the University of Chicago and his colleagues reported identifying tin, until now the heaviest element found between stars.

—*R. Cowen*