

# When your lonely heart breaks: The association between loneliness and cardiovascular death in the elderly



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LONELINESS, WHILE NOT CURRENTLY RECOGNIZED AS A CLINICAL SYNDROME, HAS RECENTLY BECOME THE FOCUS OF MUCH ATTENTION DUE TO ITS CORRELATION WITH AN INCREASED RISK FOR CARDIOVASCULAR DISEASE AND OTHER DEGENERATIVE CONDITIONS IN THE ELDERLY. DESPITE ITS INFLUENCE ON HEALTH AND LONGEVITY, FEW STUDIES HAVE IDENTIFIED EFFECTIVE INTERVENTIONS FOR MANAGING LONELINESS, AND RESEARCH HAS REVEALED THAT PHYSICIANS ARE NOT INFORMED OR COMFORTABLE IN TREATING LONELINESS. THIS ARTICLE REVIEWS THE MECHANISMS BY WHICH LONELINESS IMPACTS ON CARDIOVASCULAR HEALTH, AND EXPLORES MEDICAL MANAGEMENT OF THIS HEALTH DETERMINANT.

## CASE #1: MRS. G. AND THE WALK-IN DOCTOR

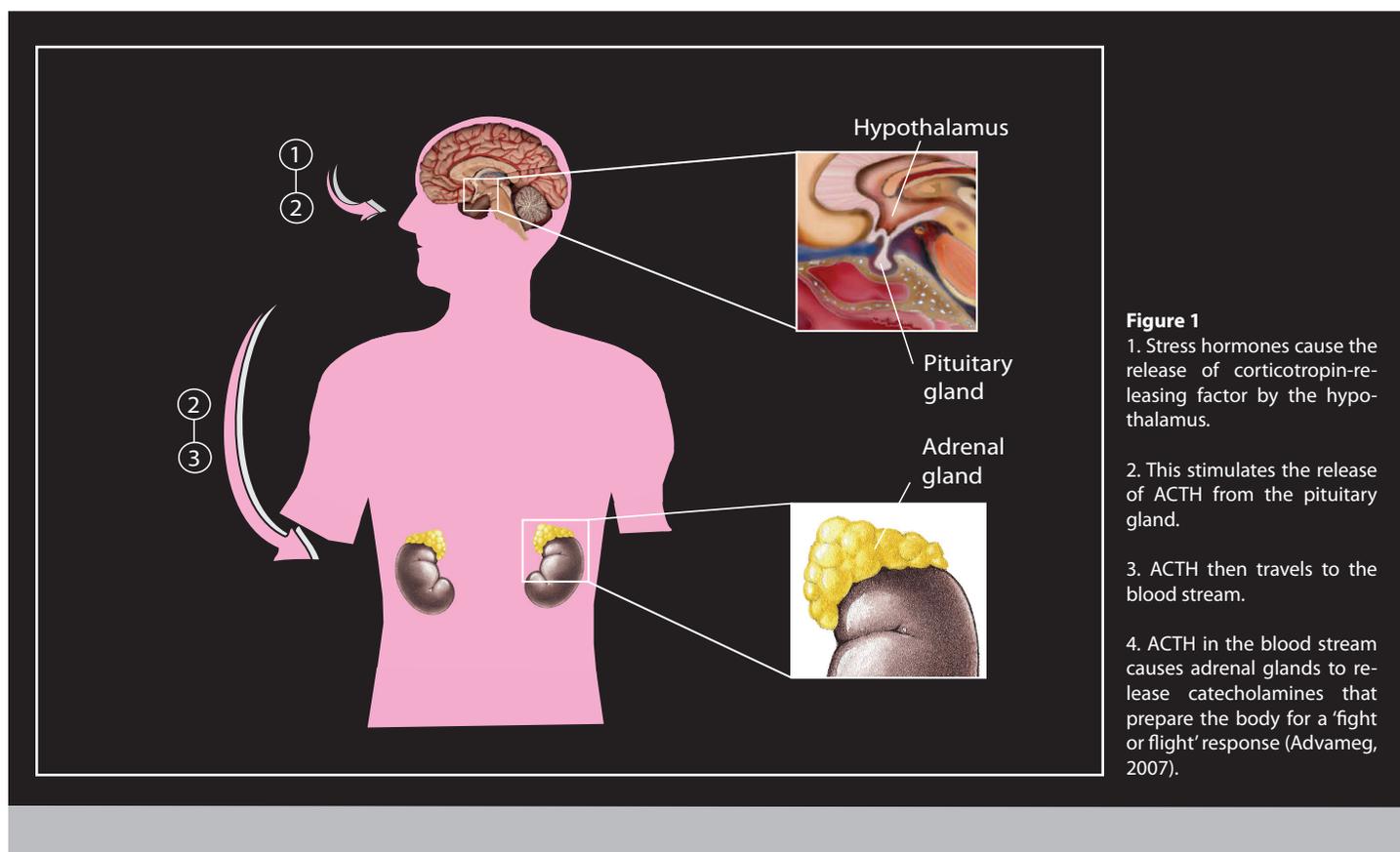
Mrs. G. is a 71-year-old woman who has recently been in hospital for a myocardial infarction. Her previous family doctor is now retired, and she is being looked after by a young doctor in a walk-in clinic. She sees the doctor two weeks after leaving the hospital. He finds that Mrs. G. is taking all of her prescribed medications, is no longer having any symptoms of heart disease and that her blood pressure is normal. The doctor books a follow-up appointment for one month later but the patient cancels the appointment because she is unable to arrange transportation. Two months later, she dies in her sleep from sudden cardiac death.

In this case, this patient received optimal medical management. Could loneliness have contributed to this woman's heart attack? This has been the focus of considerable research

and speculation in recent years. This article reviews the impact of loneliness on cardiovascular health, and the role of physicians in identifying and managing loneliness.

## EPIDEMIOLOGY

Loneliness is very common amongst the elderly. In a Finnish survey of 4000 elderly subjects, 39 percent reported feelings of loneliness (Routasalo, 2006). In recent years, it has been found that an increasing number of elderly people are living alone and fewer have close friends or family. In 1987, 8.5 million American senior citizens lived alone, and it is projected that 13.3 million elderly people will live alone by 2020 (Diehm, 2000). A study published by Duke University reported that in 1985, the average American had three close confidants, whereas in 2004, the



**Figure 1**  
 1. Stress hormones cause the release of corticotropin-releasing factor by the hypothalamus.  
 2. This stimulates the release of ACTH from the pituitary gland.  
 3. ACTH then travels to the blood stream.  
 4. ACTH in the blood stream causes adrenal glands to release catecholamines that prepare the body for a 'fight or flight' response (Advameg, 2007).

average American only had two confidants with one quarter of study participants having no close confidants (McPherson, 2006).

A number of social and health factors influence the risk of loneliness. Women are more likely to report loneliness than men (Beal, 2006). Loss of a spouse, lack of new contacts, poverty, lack of religious beliefs, loss of mobility and physical disability are all significant risk factors (Cohen-Mansfield, 2005; Lauder, 2006). Mental illness and alcohol abuse are also risk factors for loneliness (Akerlind, 1992; Elisa, 2006).

## LONELINESS AND LONGEVITY

Loneliness may be a risk factor for life-threatening cardiovascular conditions. Studies have found a strong association between longevity and social support. In a study on male health professionals, participants who were unmarried, had fewer than six relatives or friends or were inactive in the community had a higher risk of death from stroke, heart disease, accidents and suicide (Kawachi, 1996). In a nine-year study, subjects with the greatest number of close friends or relatives had a 60 percent reduction in the risk of death (Berkowitz, 2002). A nationwide study of 280,000 Americans reported that widowed men and women had a 25 and 50 percent greater risk of cardiovascular death, respectively (Johnson, 2000). Lonely individuals are not only at a greater risk for being diagnosed with heart disease, but are also less likely to recover. In a Swedish study of 1290 patients undergoing coronary bypass surgery, those reporting loneliness had a 2.6 times greater risk of death after thirty days, and a 1.8 times greater risk at five years, after adjusting for other risk factors (Herlitz, 1999).

Since these are observational studies, it is difficult to establish a causal relationship between loneliness and health. For example, a cross-sectional survey of 1300 adults found that smoking and obesity are more prevalent amongst lonely



Elderly people may often be lonely and are therefore at greater risk for the health complications that loneliness could cause. Physicians should be aware of the role that loneliness plays in the health of this population and address the issue accordingly.

individuals, elevating their risk for heart disease (Lauder, 2006). However, other studies attempt to statistically adjust for causative factors of heart disease, such as smoking and obesity.

While the connection between cardiovascular disease and loneliness has been the focus of much attention, loneliness may also contribute to other serious health problems in the elderly, such as depression and dementia. A Swedish study found that socially isolated elderly patients were significantly more susceptible to developing dementia than their peers with a social support network (Fratiglioni, 2000). Studies have also determined that loneliness is a major risk factor for depression which is independent of demographic variables, social support, or perceived stress (Barb, 2006; Cacioppo, 2006). A survey of 1000 elderly patients found that loneliness and a lack of relationship with their neighbours were the most important predictors of psychological distress and depression (Paul, 2006). In one study of patients over the age of 85, neither loneliness nor depression alone contributed to a significant morbidity; when both factors were present, a significant difference was detected (Arehart-Treichel, 2005).

## MECHANISMS

Research concerning the cardiovascular effects of loneliness has focused primarily on hypertension. One study of adults over 50 showed that loneliness can increase a blood pressure reading by 30 points in patients (Cacioppo, 2006). In another study of 230 older patients, a strong relationship was found between loneliness and systolic blood pressure (Hawkey, 2006). Other stress-related mechanisms may also damage the cardiovascular system. For example, the stress hormone cortisol is associated with elevated levels of several clotting factors, such as fibrinogen and von Willebrand factor (von Kanel, 2007). These clotting factors increase the risk of blood clots in the arteries of the heart or brain. Stress also alters heart rhythm, and may cause the release of fat in the bloodstream, temporarily increasing cholesterol (Encyclopedia of Mental Disorders, 2006).

The effects of loneliness on the cardiovascular system may be mediated through hormones and neurotransmitters. Loneliness is linked with the elevated stress response which activates the hypothalamic-pituitary-adrenal system (HPA) (Encyclopedia of Mental Disorders, 2006). One study showed that daily cortisol levels are influenced by loneliness and other emotional states (Adams, 2006). Moreover, researchers at McGill University have discovered that a lack of social support is associated with higher levels of cortisol (McGill Reporter, 2002).

Cortisol is synthesized in the adrenal gland, located just above the kidneys. Its release is controlled by a pituitary hormone called adrenocorticotropic hormone (ACTH), which also releases epinephrine and norepinephrine from the adrenal glands in response to stress (Figure 1).

Epinephrine and norepinephrine are catecholamines that prepare the body for a 'fight or flight' reaction; a combination of increased heart rate and arterial constriction

elevates blood pressure. Persistently high blood pressure damages the inner wall of the blood vessels. Plaques, such as fatty deposits, settle in the roughened sections of the vessel wall and may trigger clot formation. The plaques and clots block the flow of blood through vessels in the heart and the brain, leading to heart attacks and strokes (Encyclopedia of Mental Disorders, 2006).

## CAN LONELINESS BE TREATED?

Despite the impact of loneliness on health, there has been a lack of research into practical interventions for its management. A systematic review identified 21 studies on interventions for loneliness (Cattan, 2005). Nine out of ten studies that used group programs were effective, whereas only two of eleven individual counselling interventions were successful. Group programs gave patients the opportunity to meet new people and engage in group activities, while teaching them loneliness-management strategies (Aday, 2006; Collins, 2006). While these studies demonstrated improvements in self-reports of loneliness and social engagement, they generally had small sample sizes and were conducted over a short time period. The improvements were not always sustained and the studies failed to demonstrate increased longevity or decreased mortality from heart disease (Kremers, 2006).

Despite its link to depression, the review did not identify any interventions to manage loneliness and it is not recognized as a clinical syndrome. While not all lonely patients are clinically depressed, loneliness can be both a risk factor and a result of depression. Furthermore, clinically depressed patients are less likely to seek professional help due to fear or lack of motivation for basic social interaction. Antidepressants might help such patients by balancing the moods that contribute to the patient's isolating behaviour (Psychology Information Online, 2003). Counseling for depression can be effective; for example, one review found that 'activity scheduling' improved the quality of life in depressed patients (Cuijpers, 2006). More research into loneliness and its response to counselling

is needed to maximize the benefits of this intervention.

## WHAT CAN DOCTORS DO?

Lonely patients are more likely to access healthcareservicesuchastheemergency department than non-lonely patients with similar illnesses (Geller, 1999). Yet surveys have found that physicians feel less comfortable dealing with loneliness than with other psychosocial problems in the elderly (Gray, 1983). In a qualitative study, physicians reported that older people are often reluctant to admit that they are lonely or depressed (Murray, 2006). Another qualitative study found

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“Older people are often reluctant to admit that they are lonely or depressed.”

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that both physicians and patients view loneliness and depression as an inevitable part of aging, for which little can be done (Burroughs, 2006).

Given its importance to health, researchers have advised clinicians to pay greater attention to loneliness. "... Loneliness should command clinicians' attention in its own right—not just as an adjunct to the treatment of other problems such as depression." (Heinrich, 2006). This suggests that physicians should inquire about loneliness in elderly patients who exhibit symptoms for heart disease, depression, grief, dementia, or alcohol abuse. It should be the physician's responsibility to arrange referrals to community services and provide advice, support and sufficient follow-up. The physician-patient relationship should be maintained in periods of increasing disability and social isolation (Quill, 1995). As one author commented, "there is a world of difference between facing an uncertain future alone and facing it with a committed, caring knowledgeable partner [the physician]..." (Quill, 1995).

Doctors should encourage the patient to become involved in community

activities such as religious organizations, social clubs, health centers, adult education classes or volunteering. Housebound patients can volunteer through telephone support services or letter-writing for charity organizations. They should also be encouraged to join support groups with those who have similar illnesses (Tidy, 2005). Small lifestyle changes such as owning a pet may also be beneficial in helping to manage loneliness (Banks, 2002).

## CASE #2: MRS. G AND HER LIFELONG FAMILY DOCTOR

Mrs. G visits her family doctor whom she has known for 25 years. The doctor determines she has normal blood pressure and no symptoms of angina. He asks Mrs. G how she is feeling; she says that she's frightened that she will die of a heart attack and she's lonely because her children are not going to be able to visit her at Christmas. She won't visit neighbours because she fears that walking up and down her stairs might trigger another heart attack. The doctor suggests attending cardiovascular rehabilitation program offered at the local hospital, but Mrs. G is hesitant due to the traveling involved. Consequently, he suggests that she spend a small amount of time each day walking around her neighbourhood. The doctor advises the patient to take the train to visit her children and grandchildren.

The doctor calls the occupational therapist who works with the patient to use community resources for information and support. After following the advice of her physician and therapist, Mrs. G. has had no signs of recurrence of heart disease and continues to see her doctor regularly.

## CONCLUSION

Loneliness is a major risk factor for cardiovascular disease, as well as for other health problems such as depression and dementia. Its effects may be mediated through elevations in the stress hormones. This leads to an increase in blood pressure, which can cause heart attacks and strokes. There are many causes of loneliness, including lack of mobility, poverty, loss of loved ones, physical disability and mental

illness. Interventions that involve community support and group activities appear to be effective in alleviating loneliness. There is currently no evidence indicating that formal interventions to treat loneliness will decrease the likelihood of death from cardiovascular diseases. However, patients with heart disease and social support have a lower mortality rate compared to similar patients without social support. Physicians who have a close relationship with their patients are in a position to help them overcome loneliness through support, advice, referral to organizations in the community, and treatment of depression if necessary. 

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