The Links Between Heart Disease and Depression

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By

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Abstract

The role of depression associated with heart disease has drawn increasing attention over the past two decades, not only in regard to its potential contribution to the development of the disease, but also because of the adverse impact on prognosis among patients diagnosed with the disease. Many studies have been performed to examine whether depression causes heart disease and vice versa. After examining a selection of studies, it is obvious that there is some link between the two diseases. Despite this evidence, depression is not considered a risk factor for heart disease. In the vast majority of healthcare facilities that treat heart disease, patients are not even screened for depression. The failure of physicians to treat depression as a risk factor for heart disease has caused thousands of depressed people to develop a deadly disease that could be prevented if they would be treated for their depression. This failure has also caused thousands of heart patients to die unnecessarily as a result of their depression caused or worsened by heart disease. Because, in this case, patients may not be able to rely on the medical community, the patients and their loved ones must be educated on how to screen for depression themselves. All of the progress made in the fight against heart disease could be taken one step further if depression would be universally recognized as a significant risk factor for the development and progression of heart disease.
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While completing my internship at The Care Group LLC Cardiac Rehabilitation at Saint Vincent's Hospital in Indianapolis, I noticed how emotionally down many of the patients seemed to be. While talking to some of the patients, they would confide in me about how depressed they were. One was so depressed he would just sit in his 'Lazy Boy' all day long. Experiencing all of this made me wonder how common depression associated with heart disease was. This thesis shows what I have found.

Heart disease and depression are separately both daunting diseases. Heart disease alone is the number one killer of both men and women in the United States. "According to the National Institute of Mental Health, roughly nineteen million American adults will suffer some form of depression over the course of a given year. That is more than one in nine" (Harvard Heart Letter). "About fifteen percent of all people have depression at least once in their life" (American Academy of Family Physicians). McManamy reported that about fifty percent of people with heart disease develop depression. He also stated that three to five percent of the population is depressed at any given time. With heart patients the number is eighteen percent. In general depression is under-reported and under-treated. "Depression occurs in nineteen to thirty percent of older people, but only one percent of those with the condition are receiving treatment" (Saunders).

The role of depression associated with heart disease has drawn increasing attention over the past two decades, not only in regard to its potential contribution to the development of the disease, but also because of the adverse impact on prognosis among patients diagnosed with the disease. "One sobering report concluded that among those who have had a heart attack, depression more than quadrupled their
chances of dying within six months" (Chen 110). “Major depression strikes about twenty-five percent of all people recovering from a heart attack, and another forty percent suffer mild depression” (Woolston).

Despite this evidence, depression is not considered a risk factor for heart disease. Traditional risk factors for heart disease include high blood pressure, high cholesterol, smoking, and a sedentary lifestyle. Though these risk factors are well documented and researched, they can only explain forty percent of heart disease cases (Chen 109). Like depression, stress and having a ‘type A’ personality have been suspected of contributing to heart disease for twenty-five years. Throughout these years, research has supported that only two characteristics of ‘type A’ behavior, anger and hostility, have detrimental effects on the heart. To this day stress is also not considered a risk factor for heart disease.

There are many emotional and biological reasons why depression could contribute to heart disease. Depressed people have poor health habits in general. They are more likely to be smokers, and less likely to eat right. Depression also lowers the immune system, which makes depressed people more susceptible to many diseases. With heart disease, having a low immune response makes it harder for the body to heal injuries to artery walls, which could cause plaque to buildup. Also, studies have found that the nervous system of depressed people reacts in the same harmful way as those who are assertive and angry, but at a lower scale. Stress is also a frequent byproduct of depression. Depressed people have excess levels of adrenaline, cortisol, and other stress hormones. These hormones increase heart rate and hyperactive platelets that may speed the buildup of fatty plagues, clog arteries, and
damage the inner lining of the heart muscle. It is also documented that these hormones can increase bad cholesterol and abdominal fat. These are some of the biological responses that set the stage for a heart attack. Mental distress also seems to encourage blood cells called platelets to clump together, possibly allowing for artery clogging blood clots to form, which could cause a heart attack. Depression also makes it more difficult for the heart to adjust its speed to the body’s demands. This can lead to arrhythmias or erratic heartbeats that could cause sudden cardiac death (Chen 112).

McManamy proposed another theory about how depression affects the heart. The study was performed by Duke University, and examined serotonin deficiency. Serotonin is a brain neurotransmitter associated with mood, and levels of it are affected by antidepressants. In the study, fifty-six men and women were asked to recall past events that made them sad or angry. The subjects were analyzed before and after they recalled the stressful situations. In the analysis, their blood was screened for cytokines. Cytokines are proteins that are produced in response to stress. “The men with low serotonin levels produced higher levels of two specific cytokines, interleukin 1 alpha and tumor necrosis factor alpha, which are known to contribute to atherosclerosis” (McManamy). Atherosclerosis is a buildup of fatty plagues in the arteries. The women only showed a rise in the first of the two cytokines.

Johns Hopkins University has also conducted research on the subject. In an analysis of data from 3,242 men and 3,849 women between the ages of seventeen and thirty-nine, men with major depression or a history of previous major depression had elevated levels of C-reactive protein (CRP). CRP appears to be a risk factor for cardiovascular disease (CVD), according to Dr. Ford of Johns Hopkins University. The
researchers adjusted for age, race, body mass index, blood lipid levels, diabetes, systolic blood pressure, tobacco smoking, and alcohol intake, and compared these men to men with no history of major depression. The data did not show a similar trend in women.

Lately researchers have been digging deeper into the possible emotional causes of coronary heart disease (CHD). "Anyone carrying too much negative emotional baggage – be it anger, sadness, or twitchy apprehension – is in danger, researchers now say" (Chen 109). Thomas Pickering, M.D., Ph.D., a heart disease and hypertension specialist at Mount Sinai's Weiner Cardiovascular Institute, has been quoted as saying, "Depression is probably as important as blood pressure and physical inactivity as a risk factor for developing heart disease" (quoted in Chen 109). In the vast majority of healthcare facilities that treat heart disease, patients are not screened for depression, let alone treated for this all too common disease. Because of this, it is important to examine the evidence of the link between heart disease and depression as presented in the following research.

Possibly the first study to research a connection between heart disease and depression was a population based case-control study performed on all 5,623 patients registered with one general practice to study depression as a risk factor for ischaemic heart disease. In this study, 188 male cases with heart disease were compared with 485 controls without heart disease that were matched by age, and 139 female cases with heart disease were matched by age to 412 controls. The researchers found that the risk of ischaemic heart disease was three times higher among men with a recorded diagnosis of depression within the preceding ten years than among controls of the same
age. The association held up when smoking status, diabetes, hypertension, and underprivileged area score were included in the analysis. The researchers did not find depression to be a risk factor for heart disease in women; however, they acknowledged this finding could be due to the methods used in the study.

A study by Johns Hopkins School of Medicine published in 1998 found that men who were clinically depressed were twice as likely as those who were not depressed to suffer heart attacks or develop other heart illnesses. These findings are some of the strongest in suggesting that depression causes heart disease. The study tracked 1,190 male medical students from Johns Hopkins University between 1948 and 1964. These researchers also factored in analysis of cholesterol and blood pressure. However, their study relied on the subjects' self report of clinical depression, rather than on findings from standardized interviews. Twelve percent of the men reported suffering at least one episode of clinical depression during the forty years of the study. These men were found to be twice as likely to develop coronary artery disease or suffer a heart attack when compared to those in the study who never suffered from clinical depression during the time of the study. This is comparable to the increased risk caused by smoking. According to the Centers for Disease Control and Prevention, smokers are about twice as likely as nonsmokers to develop heart disease. Dr. Daniel E. Ford, professor of epidemiology and health policy at Johns Hopkins University has been quoted saying, "Does depression cause heart disease? I think the evidence shows that it does." In addition, the researchers also studied 150 women. They found the results to be the same for women as for men after accounting for diabetes, high blood pressure, smoking, and high cholesterol.
“According to an article published in the May 8 issue of the Archives of Internal Medicine, men and women with depression are at increased risk for coronary heart disease, but only men are at increased risk of dying from the disease” (Mental Health Weekly). Researchers for this study examined data from 1982 until 1984 for 5,007 women and 2,886 men who were enrolled in the National Health and Nutrition Examination Survey. The participants were evaluated for depression and did not have heart disease. The study found that almost eighteen percent of the women and ten percent of the men were depressed. After follow-up interviews in 1992, they found that 187 women had experienced nonfatal CHD events and 137 had died from heart disease, while 187 men had nonfatal CHD events and 129 men died of heart disease. The researchers concluded that women with depression were seventy-three times more likely to develop heart disease than the women who were not depressed. The women with depression were not at an increased risk of dying from heart disease compared to the non-depressed women. Men with depression were at a seventy-one percent greater risk for heart disease, and were a little over two times more likely to die from the disease than were men without depression.

Ohio State University completed a ten-year study of almost 3,000 men and 5,000 women. They found that depressed men were seventy percent more likely to develop heart disease than others in the study who were not depressed. "At the same level of depression, women were twelve percent more likely to develop heart disease, but the risk went up by seventy-eight percent when the researchers looked at women with more severe depression" (Christensen). Their findings held up after adjusting for other heart disease risk factors such as age, weight, blood pressure, and smoking.
Studies done with elderly patients instead of young or middle aged individuals have also produced valuable information. The elderly are an important population to study the link between heart disease and depression because of their increased vulnerability. According to the National Institute of Mental Health, roughly one million of the thirty-four million Americans who are sixty-five or older suffer from depression. Some experts say that as few as one percent of the one million elderly with depression receive treatment despite the fact that nearly eighty percent of them could be helped with medications, psychotherapy, or both. These figures put many elderly Americans unnecessarily at risk for heart disease.

In 1998, Archives of Internal Medicine reported on a study, which concluded, "depressive symptoms may not be independent risk factors for CHD outcomes in elderly population in general, but may increase risk among relatively healthy older women" (Mendes de Leon). Unlike many of the other studies that examined middle-aged people to see if depression was a risk factor for heart disease, this study examined the role of depression in predicting heart disease in the elderly. Standard risk factors are inconsistent in predicting coronary artery disease in elderly patients, and thus are less useful in identifying high-risk individuals than they are in middle age. The findings in this study were consistent with this fact. Depression does not predict heart disease nearly as consistently in elderly populations as it does in middle-aged populations.

This study found that among older women, but not older men, depression is associated with an increased risk for events associated with coronary heart disease independent of CHD risk factors. However, when they adjusted for impaired physical function, the correlation decreased to non-significant levels. This meant that the
increased incidence of heart disease in depressed elderly women could be due to the fact that they were physically impaired, and thus not as active as the unimpaired/undepressed women in the study. This finding raised the possibility that impaired physical function could be one step on the road between depression and CHD.

The August 1998 issue of the Harvard Heart Letter reported a long-term prospective study of 3,701 elderly men and women. They were all over seventy years old, and from eastern Massachusetts, Iowa, and Connecticut. None of the participants had evidence of heart disease at the beginning of the study. A standard questionnaire was used to screen participants for evidence of depression in 1982, 1985, and 1988. For both men and women, chronic depression did not increase the risk for cardiovascular events or deaths. They did find, however, that depression that was newly developed in patients in 1988 increased the risk for heart disease substantially for men, but not for women. "For these men, the risk of dying from cardiovascular disease increased seventy-five percent compared with those who had never been depressed, and their risk for new coronary heart disease events more than doubled" (Grumpy).

Opposite of the previous study, this study found that depression increases the cardiovascular risk in older men, but not older women.

The Cardiovascular Health Study Collaborative Research Group performed another study that examined a link between heart disease and depression in the elderly. In their study of 4,493 healthy people aged sixty-five and older, symptoms of depression were found to be an independent risk factor for heart disease and total mortality. This risk also increased with higher scores of depression. Participants in the study were free of cardiovascular disease at the onset of the study, and were evaluated annually for
symptoms of depression and heart disease for six years. "Every five unit increase in depression score was associated with a fifteen percent increased risk of CHD" (Ariyo). The results were the same for both sexes. To evaluate depression, the researchers used a modified version of the Depression Scale of the Center for Epidemiological Studies. For those with the highest scores on the scale, the risk of heart disease increased by forty percent, and the risk of death by sixty percent. This study differs from other studies because it shows the importance of incremental risk with higher depression scores. Because the study excluded patients with previous heart disease, it prevented the possibility that depressive symptoms were a result of heart disease rather than a cause.

Chen reported about a study that tracked 2,846 elderly people in Amsterdam for over four years. These researchers found that for the subjects who began the study without any coronary disease, but with major depression, they were nearly four times more likely to die of heart problems than the other subjects.

Though it is evident that depression can cause heart disease, in some cases heart disease can cause depression. "As many as sixty-five percent of patients with acute myocardial infarction (heart attack) report experiencing symptoms of depression; major depression is present in fifteen to twenty-two percent of these patients" (Guck). The diagnosis of heart disease can cause individuals to become depressed for a number of reasons. According to Rippe, author of The Healthy Heart For Dummies, there is a three part psychological response to having a heart attack. During and immediately following the event, the individual will experience a great amount of anxiety, as well as overwhelming fears of dying. The second stage is denial. In this stage the
individual will not accept that anything is seriously wrong with them. The third phase is called "home coming depression". When this happens, the individual will become depressed and worried about their long-term health and the consequences of their heart attack. They may also begin to feel guilty and regretful about their lifestyle prior to the heart attack that contributed to their heart disease. Also, medicines used to treat coronary artery disease may cause a person to be more susceptible to becoming depressed. However, clinical depression is not a normal part of the recovery process.

Once a heart patient becomes depressed, it can seriously lower their will to fight the disease. Woolston reported that "a study in the June 26, 2000 issue of Archives of Internal Medicine found that severely depressed heart patients were less likely than non-depressed patients to exercise regularly, give up smoking, eat a low-fat diet, or generally follow their doctor's advice."

Research has also been done on depression onset by heart disease. "Two large community epidemiological studies demonstrated a significant relationship between depression and mortality in patients with myocardial infarction" (Guck). According to Robert Carney, Ph.D., a Washington University psychologist, "Research has found that in people who already have cardiovascular problems, depression boosts the risk of heart attack or sudden cardiac death" (Chen 110). Woolston quoted Dr. Dean Ornish as saying, "Among heart patients, depression is as good a predictor of imminent death as smoking, obesity, or a previous heart attack. Study after study shows that people who are lonely, depressed, and isolated are three to five times more likely to die prematurely than people who feel connection in their life."
Researchers at the Montreal Heart Institute tracked 222 heart attack survivors and found that those suffering from depression were roughly six times more likely than others to die within six months of their attack. The researchers later found that depression also led to an eight-fold increase in death rates eighteen months after a heart attack. This study shows that the longer a patient is depressed after a heart attack, the greater the risk is of them dying.

Depression is frequently undiagnosed and untreated in patients with cardiovascular disease. Since it is not common to screen for depression, cardiologists and primary care physicians may not realize their patients are depressed. According to the April 2001 Harvard Heart Letter, twenty-five percent of cardiac patients experience major depression after a heart attack, and sixty-five percent exhibit at least some depressive symptoms. Guck et al. estimated that only twenty-five percent or less of cardiac patients with major depression are diagnosed with depression, and only about one half of those patients receive treatment for depression. Unless depression is recognized, it cannot be treated.

There are reasons why doctors may miss the diagnoses of depression. One reason is that some symptoms of depression, such as fatigue and insomnia, are also symptoms of coronary artery disease. Also, physicians and patients may erroneously believe that depression is a normal response to having cardiovascular disease. Patients may be reluctant to report symptoms of depression, and physicians may be reluctant to ask their patients about depression. Only about one in three people who are depressed seek help. Another reason is that some insurance carriers are increasingly denying payments to family physicians for treating depression, regardless
of how effective the treatment may be. Finally, physicians may be reluctant to prescribe antidepressant medications to patients with cardiovascular disease because of potential adverse side effects.

Because, in this case, patients may not be able to rely on the medical community, the patients and their loved ones must screen for depression themselves. Knowing the symptoms of depression is very important. Depression saps a person’s energy. Even routine tasks may become daunting. “In many cases, depressed individuals lose interest in the world around them and withdraw from social and professional contacts” (Harvard Heart Letter). Overwhelming guilt and suicidal thoughts are also common. Woolston reported that according to the National Institute of Mental Health, depression should be suspected if a person has five or more of the following symptoms nearly every day for at least two weeks:

- Frequent feelings of sadness or emptiness.
- Loss of interest in pleasurable activities.
- Strange eating or sleeping patterns.
- Changes in body weight.
- Excessive crying.
- Thoughts of suicide and death, or suicide plans or attempts.
- Fatigue or low energy most of the time.
- Difficulty concentrating, remembering, and making decisions.
- Feelings of worthlessness, inappropriate guilt, or helplessness.
- Irritability.
- Unexplained aches and pains that do not respond to treatment.
• A slowdown in performing tasks, or restlessness and an inability to sit still.

Heart patients do not need to suffer from depression. There are ways that they can prevent themselves from becoming depressed after being diagnosed with heart disease or having a heart attack. Regular exercise can improve mood, boost energy, increase the immune system, improve circulation, increase cardiovascular wellness, and promote weight loss. Many heart patients benefit physically and mentally from involvement in a cardiac rehabilitation program. Beginning a hobby or getting involved in a recreational activity can also improve mood.

If it is suspected that a heart patient may be suffering from depression, they should seek help from their family doctor or a mental health professional. “The most effective psychosocial treatment for depression in patients with myocardial infarction is cognitive-behavior therapy” (Guck). Cognitive-behavior therapy emphasizes short-term, practical, problem-focused skill development in environment, thoughts, emotions, behavior, and physiology. It is also recommended that they join a support group for heart attack survivors, such as Mended Heart, which is sponsored by the American Heart Association.

Once a person enters treatment, chances are they will improve. “Between eighty and ninety percent of people with depression do well with treatment” (American Family Physician). A recent study from Duke University Medical Center found that a stress management program cut the chances that a heart patient would suffer a heart attack or need surgery by seventy-four percent. The April 2001 issue of the Harvard Heart Letter reported that “an analysis of twenty-three studies found that over a two-year period, psychosocial interventions appeared to reduce the recurrence of cardiovascular
problems." Treating depression can relieve not only the emotional burden, but also reduce the medical consequences as well.

It is crucial for family members to be involved in the rehabilitation process of patients who have had a heart attack. Family members often experience feelings of helplessness, loss, and depression similar to those of the patient. The patients' partners may be fearful about the return to activity, including sexual activity, because of not being educated about the process. Educating patients' families and partners is very important in allowing them to provide a supportive role in recovery.

The failure of physicians to treat depression as a risk factor for heart disease has caused thousands of depressed people to develop a deadly disease that could be prevented if they would be treated for their depression, as well as their other risk factors. Failure of physicians to screen heart patients for depression is causing thousands of heart patients to die unnecessarily as a result of their depression caused or worsened by heart disease. The bottom line is that there is an obvious link between depression and heart disease, but a direct cause and effect has yet to be proven. One reason for this lack of evidence could be researchers unwillingness to explore the connections between the mind and body.

The good news is that there are ways to prevent both heart disease and depression from ever affecting a person in the first place. Proper diet, exercise, sleep, and avoidance of stress can prevent the two diseases. If an individual happens to be diagnosed with one or both of the diseases, they can not only do the fore-mentioned activities, but also comply with medications and other methods of treatment prescribed.
The battle against heart disease has frequently taken center stage among the major health concerns in the United States for the past twenty years. The importance of early detection and control of cardiovascular risk factors, such as hypertension and high cholesterol, have played a significant role in the prevention of heart disease. Family physicians have been at the forefront of these efforts. All of the progress made in the fight against heart disease could be taken one step further if depression would be universally recognized as a significant risk factor for the development and progression of heart disease.
Works Cited


