

The “Merry Christmas Coronary” and “Happy New Year Heart Attack” Phenomenon

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In 1999, my research group published a study that examined whether there are seasonable variations in cardiac mortality in a location where winter weather is mild—Los Angeles County, Calif.¹ During a 12-year period, there were consistently more deaths from ischemic heart disease during the winter than there were during the summer. About one third more deaths from ischemic heart disease were recorded in December and January than from June through September in Los Angeles County. We initially thought that this phenomenon might be explained by colder temperatures. Colder temperatures have been associated with an increase in vascular resistance, coronary vasospasm, blood pressure, and hemostasis, as reviewed by Spencer et al.² Temperatures in Los Angeles during the winter, although colder than they are during the summer, are still mild as compared with other climates. When we plotted daily rates of death from ischemic heart disease in Los Angeles County during November, December, and January, we were struck by an increase in deaths starting around Thanksgiving, climbing through Christmas, peaking on New Year’s Day, and then falling, whereas daily minimum temperatures remained relatively flat during December and January. We postulated that this peak in cardiac deaths during the holidays might result from other factors, including the emotional stress of the holidays, over-indulgence during the holiday season, or both.¹

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The study by Phillips and coworkers³ in this issue of *Circulation* is an important contribution that extends our initial observation of an increase in cardiac deaths during the holiday season. They have done this by widening the investigation to the entire United States, extending the number of years examined, and examining both cardiac and noncardiac causes of death. Their analysis not only confirms our observation of an increase in cardiac deaths during the holiday season,¹ but they also describe 2 discrete peaks in cardiac death—one for Christmas and one for New Year’s.³ They observed this holiday peak nationwide, and it seems to be worsening, especially in the last several years studied. Inter-

estingly, the phenomenon is slightly less pronounced in northern compared with southern border states. Perhaps residents of northern states become better acclimated to stress in a colder climate.

Both Phillips’ group³ and our group proposed a number of mechanisms for the observation of the increase in cardiac deaths during the holiday season.^{1,4} Some proposed mechanisms are listed in the Table. Although Phillips et al have dismissed several of them,² the exact mechanisms remain to be determined. I believe that changes in diet and alcohol consumption should still be considered a potential mechanism in that it could explain some of the observed peak in cardiac deaths in outpatients. In addition, the degree of regulation of diet in inpatients may be variable because inpatients’ relatives and friends tend to bring gifts of food to them. People tend to gain weight during the holiday season and take in more salt, which can put additional stress on a weakened heart. Furthermore, fatty meals can have acute adverse effects on endothelial function. Excess use of alcohol during the holidays is unlikely to appear on medical records or death certificate data (the main data source for the study of Phillips et al) and should not be dismissed.

Emotional stress is another factor that still may be important. During the holiday season, patients may feel stress from having to interact with relatives whom they may or may not want to encounter; having to absorb financial pressures such as purchasing gifts, traveling expenses, entertaining, and decorating; and having to travel, especially in the post-September 11, 2001, era. Even people with Alzheimer disease may be forced into a more unfamiliar environment or become stressed by the increased commotion or interaction with visitors during the holiday period.

Respiratory issues still may be important. Burning wood in fireplaces, which tends to be a popular activity during the winter holidays, releases toxic particulate material into the air. Particulate airborne pollutants have been associated with an increase in cardiac events and an increase in blood pressure.⁵⁻⁷

Inappropriate delay in seeking medical care is an intriguing concept that Phillips and colleagues describe, and this may be important.³ Of equal concern are the possibilities that staffing levels at hospitals and other healthcare facilities may be reduced during the holiday season or that holiday on-call scheduling may result in staff caring for patients with whom they are less familiar. Clearly, more research is needed to nail down the exact mechanism(s)³ for the “Merry Christmas Coronary” and “Happy New Year Heart Attack.” If the mechanism(s) can be identified and appropriate therapies developed, then significant numbers of cardiac deaths can be avoided.

The opinions expressed in this article are not necessarily those of the editors or of the American Heart Association.

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Potential Mechanisms for the "Merry Christmas Coronary" and "Happy New Year Heart Attack" Phenomenon

1. Inappropriate delay in seeking medical attention
2. Reduced levels of healthcare staffing or fewer staff members who are familiar with individual patients during holiday on-call schedules
3. Increased emotional stress
4. Overindulgence (eg, increased intake of food, salt, fats, alcohol)
5. Increased respiratory problems (eg, upper respiratory infection, influenza, particulate matter generated from wood-burning fireplaces)
6. Colder weather, leading to increased vascular resistance, coronary spasm, hemostasis and thrombus formation, O₂ demand
7. Decreased hours of daylight
8. "Postponement of death" concept

Recently, our research group observed an increase in ischemic heart disease deaths that was associated with another celebration, New Year's 2000, as compared with New Year's celebrations before or after the beginning of the "new millennium."⁸ It is possible that intensified celebrations for this event, along with overindulgence, may have contributed to this increase. Emotional stress from concern about terrorist attacks or the "Y2K millennium bug" also may have contributed.

With the knowledge that the holiday season is associated with an increase in cardiac deaths, what approach should the physician take in advising his or her patients? Until the exact mechanism or mechanisms for the "Merry Christmas Coronary" and "Happy New Year Heart Attack" are known, there are a number of commonsense and prudent tactics that the physician should consider, especially for patients with established cardiac disease or for those with known risk factors for cardiac disease:

1. Instruct patients to avoid delay in seeking medical attention, should cardiac symptoms occur.
2. Examine patients himself or herself, if possible, rather than relying upon healthcare providers not familiar with the patients.
3. Coronary care units and emergency departments should be adequately staffed, and the staff should be aware that they may notice an increase in cardiac cases during the holiday season.
4. Instruct patients to avoid the known triggers for acute myocardial infarction, as described by Muller et al,⁹ Mittleman et al,¹⁰ and Verrier and Mittleman,¹¹ including excess physical exertion (especially shoveling snow), overeating, lack of sleep, emotional stress, illegal drugs, and anger. Avoid excess salt and alcohol intake. (Alcohol can also precipitate arrhythmias such as atrial fibrillation [the "holiday heart syndrome"¹²] and can depress cardiac contractility. Atrial fibrillation with a rapid ventricular rate can precipitate ischemia in a patient with coronary artery disease.)

5. Modify and treat known cardiovascular risk factors (eg, hypertension, smoking, diabetes, dyslipidemia).
6. Consider aspirin or β -blockers, or both, if appropriate.
7. Instruct patients to avoid exposure to severely cold temperatures.
8. Instruct patients to avoid participating in outdoor activities on days when air pollution alerts are issued and to avoid inhaling smoke from wood-burning fireplaces.
9. Consider flu shots where appropriate.

Our study¹ and the fine study of Phillips et al² clearly suggest that the winter holiday season is associated with a significant increase in cardiac deaths. Physicians should be aware of this "Merry Christmas Coronary," and "Happy New Year Heart Attack" phenomenon and help their patients to minimize coronary risk factors and factors that will trigger acute myocardial infarction, especially during the winter holiday season.

References

1. Kloner RA, Poole WK, Perritt RL. When throughout the year is coronary death most likely to occur? A 12-year population-based analysis of more than 220 000 cases. *Circulation*. 1999;100:1630-1634.
2. Spencer FA, Goldberg RJ, Becker RC, Gore JM. Seasonal distribution of acute myocardial infarction in the second National Registry of Myocardial Infarction. *J Am Coll Cardiol*. 1998;31:1226-1233.
3. Phillips DP, Jarvinen JR, Abramson IS, Phillips RR. Cardiac mortality is higher around Christmas and New Year's than at any other time: the holidays as a risk factor for death. *Circulation*. 2004;110:3781-3788.
4. Kloner RA. Daily, seasonal, and event-related variations in the incidence of myocardial infarction. In: Braunwald E, ed. *Heart Disease Updates*. Vol 2. Philadelphia, Pa: WB Saunders Co; 2000:1-9.
5. Schwartz J. Air pollution and daily mortality: a review and meta analysis. *Environ Res*. 1994;64:36-52.
6. Zanolletti A, Canner MJ, Stone PH, Schwartz J, Sher D, Eagan-Bengston E, Gates KA, Hartley LH, Suh H, Gold DR. Ambient pollution and blood pressure in cardiac rehabilitation patients. *Circulation*. 2004;110:2184-2189.
7. Brook RD, Franklin B, Cascio W, Hong Y, Howard G, Lipsett M, Luepker R, Mittleman M, Samet J, Smith SC Jr, Tager I; Expert Panel on Population and Prevention Science of the American Heart Association. Air pollution and cardiovascular disease: a statement for healthcare professionals from the Expert Panel on Population and Prevention Science of the American Heart Association. *Circulation*. 2004;109:2655-2671.
8. Poole WK, Chi JS, Walton JD, Kanfer S, Kloner RA. Increased cardiovascular mortality associated with the turn of the millennium in Los Angeles County, California. *J Epidemiol Community Health*. In press.
9. Muller JE, Abela GS, Nesto RW, Tofler GH. Triggers, acute risk factors and vulnerable plaques: the lexicon of a new frontier. *J Am Coll Cardiol*. 1994;23:809-813.
10. Mittleman MA, Maclure M, Tofler GH, Sherwood JB, Goldberg RJ, Muller JE. Triggering of acute myocardial infarction by heavy physical exertion. Protection against triggering by regular exertion. Determinants of Myocardial Infarction Onset Study Investigators. *N Engl J Med*. 1993;329:1677-1683.
11. Verrier RL, Mittleman MA. The impact of emotions on the heart. *Prog Brain Res*. 2000;122:369-380.
12. Ettinger PO, Wu CF, De La Cruz C Jr, Weisse AB, Ahmed SS, Regan TJ. Arrhythmias and the "Holiday Heart": alcohol-associated cardiac rhythm disorders. *Am Heart J*. 1978;95:555-562.

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