

# Is Anorexia Nervosa Associated With Elevated Rates of Suicide?

## ABSTRACT

Stanley Coren, PhD, and Paul L. Hewitt, PhD

**Objectives.** The purpose of this study was to ascertain whether individuals with anorexia nervosa are more likely to commit suicide, as suggested by previously noted associations between anorexia nervosa and mood disorders.

**Methods.** Data from death records representing over 5 million women were examined, yielding 571 cases in which anorexia nervosa was mentioned as an existing condition. The women with anorexia were compared with 1713 control subjects matched for age, sex, and race.

**Results.** The percentage of suicides among those listed as having anorexia nervosa was only 1.4%, compared with 4.1% for the controls.

**Conclusions.** These findings suggest that the suicide rate is not elevated among individuals currently suffering from anorexia nervosa. (*Am J Public Health.* 1998;88:1206-1207)

## Introduction

The *Diagnostic and Statistical Manual of Mental Disorders* defines anorexia nervosa as a disorder affecting mainly young White women.<sup>1</sup> It is characterized by low body weight, anxiety about gaining weight, undue influence of weight on self-evaluation, denial of the consequences of low weight, and amenorrhea. The number of anorexia nervosa sufferers is sufficiently high to cause grave concern; the number of new cases reported annually is 17 per 100 000 females between 12 and 25 years of age.<sup>2,3</sup> Several long-term follow-up studies have suggested that as many as 20% of all persons with anorexia will die of medical conditions caused by the disorder.<sup>4,5</sup> Reports have also suggested that the suicide rate is elevated in samples with anorexia<sup>4-7</sup>; some have stated that up to half of the deaths in anorexia nervosa are due to suicide.<sup>8</sup> The link between anorexia and suicide may be mood disorders. Several researchers have noted an increased incidence of mood disorders in persons with anorexia nervosa,<sup>6,8</sup> and mood disorders are also strongly associated with suicide.<sup>9</sup>

This study was an attempt to ascertain whether there is an increased risk of death by suicide in individuals with anorexia nervosa. This was done by observing the number of death certificates that contained a conjoint listing of anorexia nervosa and suicide among the total population of deceased individuals in the United States from 1986 through 1990.

## Methods

Because anorexia nervosa is a relatively rare condition, we used information for the entire US population over a 5-year period to obtain an adequate number of deaths involving anorexia and suicide. Data were extracted from the multiple cause of death records, which report all death certificates in the United States registered with the National Center for Health Statistics (NCHS) for 1986 through 1990 (10 655 721 death records).<sup>10</sup> This data bank lists all medical conditions that may have contributed to death (part 1 of the US Standard Certificate of Death) and any other significant medical conditions present at the time of death (part 2). This is important because death records often list only the terminal medical condition (e.g., cardiac complications, mal-

nutrition, or suicide) as a cause of death, even though the primary factor may have been anorexia nervosa, which engendered the lethal physical condition. Here, each record contains the underlying cause of death and up to 20 conditions contributing to death or present at the time of death.<sup>11,12</sup> Thus, even if the primary cause of death is not directly attributable to anorexia nervosa, if anorexia nervosa is present it will be listed as a contributing factor or existing condition.<sup>12</sup>

The causes and condition codes (307.1 for anorexia nervosa, E950-E959 for suicide) contained in the NCHS files are based on diagnostic criteria in the *International Classification of Diseases, Ninth Revision*.<sup>11,12</sup> The diagnosis takes into account the symptoms from the *Diagnostic and Statistical Manual* noted above as well as specifically excluding other confounding conditions, such as feeding problems, loss of appetite or malnutrition (whether organic or nonorganic in origin), or other eating disorders.<sup>13</sup>

Since anorexia nervosa is predominantly defined as a problem of women, subject selection was restricted to the 5 467 451 female deaths that occurred between 1986 and 1990. The sample was chosen in an inclusive manner. Any record with a listing of anorexia nervosa as the primary cause of death or as an existing condition was included. Because the rate of suicide differs as a function of age, sex, and race,<sup>14</sup> a 3:1 sample of matched control subjects (matched on age, race, and sex) was selected randomly from death records that made no mention of anorexia nervosa.

## Results

A total of 571 women had anorexia nervosa listed as an underlying cause or accompanying condition of death. Of these, 8 (1.4%) were suicides. When the matched control sample of 1713 was examined, there were 70 (4.1%) suicides. Thus the relative risk of suicide actually appears to be higher in the control sample. This finding is statistically con-

The authors are with the Department of Psychology, University of British Columbia, Vancouver.

Requests for reprints should be sent to Stanley Coren, PhD, Department of Psychology, University of British Columbia, 2136 West Mall, Vancouver, British Columbia, Canada V6T 1Z4.

This paper was accepted August 11, 1997.

firmed with a relative risk of 2.93 (95% confidence interval = 1.388, 5.855;  $\chi^2(1) = 8.58$ ,  $P < .01$ ).

## Discussion

The results indicate that, at least as listed on official death records, anorexia nervosa is not associated with an increased suicide rate. This null result is not due to inadequate statistical power, since a power analysis against the population base rate of suicide demonstrated that this sample is large enough to detect differences as small as 3% with power of 0.98.

Obviously, our ability to extrapolate from these data depends upon the accuracy of the information on the death certificates. Some have suggested that suicide rates based on death record data underestimate the true suicide rate, owing to complexities in the classification of and reporting of suicides<sup>15,16</sup> or difficulties with the interpretation of some death certificate information.<sup>17,18</sup> Even if this is true, there is no reason to expect differential underreporting for anorexic persons and controls; hence this problem affects only estimates of suicide base rates, not estimates of differences between the groups. Alternatively, it might be argued that the presence of anorexia nervosa may not be listed when the recording physician is dealing with as dramatic a form of death as suicide. However, even assuming that in 1 of every 2 cases of suicide comorbid with anorexia nervosa the anorexia is not reported (clearly an unrealistically high level of incompetence presumed for examining physicians), the proportion of suicides in the affected group would rise only to a level equal to that of the nonanorexic sample.

How, then, do we account for reports in the literature suggesting a linkage between anorexia nervosa and high rates of suicide? Most such studies have employed long-term follow-ups of individuals treated in eating-disorder programs. In many instances such individuals go into remission, and their suicide may occur years after the symptoms of anorexia nervosa have disappeared. These individuals would not be listed as being

anorexic on their death certificates; however, in a longitudinal study they are still coded as part of the anorexia nervosa group. If this is a correct interpretation, we may be dealing not with a higher incidence of suicide in anorexia nervosa patients, but rather with the possibility that the same factors that predispose an individual toward the development of mood disorders with a risk of suicide may also predispose that individual toward anorexia nervosa. In fact, it has been estimated that the rate of comorbidity of diagnoses of anorexia nervosa and depressive disorders may be as high as 50%.<sup>19,20</sup> Overall, the present data suggest that individuals with symptoms of anorexia nervosa do not seem to have elevated rates of suicide as measured by officially recorded death certificates. □

## Acknowledgments

This research was supported by grants from the Medical Research Council of Canada, the Natural Sciences and Engineering Research Council of Canada, and the Social Sciences and Humanities Research Council of Canada.

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