

Relationship between anxiety and serum cholesterol¹

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Abstract

Much information is appearing in the literature indicating that stress may be a factor in the level of serum cholesterol. This study investigated the relationship between total serum cholesterol levels in male university students, and personality anxiety as measured by standard anxiety tests. No significant relationship existed between anxiety and cholesterol. A test between the mean cholesterol level of the low anxious group and the high anxious group indicated that no significant difference between these means existed. Using a random sample of 51 students, no significant relationship was found to exist between serum cholesterol levels and scores obtained on the IPAT Anxiety Scale.

Problem

Increasing numbers of articles and studies (Groover, 1958; Mann & White, 1953; Rosenmann & Friedman, 1957) appearing in magazines and journals implicate stress as being an important factor in elevated serum cholesterol levels. Klumpp (1958) has pointed out that one of the major causes of heart attacks may be tension, strain and responsibility. Many authors (Grundy & Griffin, 1959a; Chandler et al., 1953; Grundy & Griffin, 1959b) have observed that fluctuations in total cholesterol levels between and within individuals, which are sometimes referred to as biological, may be due to emotional stress and anxiety. Chandler et al. (1953) reported that serum cholesterol levels are affected by the stress of exposure to cold, rise in fever, or myocardial infarction. Mann and White (1953) found similar results in fasting dogs and rats. An investigation by Rosenmann and Friedman (1957) concluded that temporal periods of unusual emotional stress and tension were frequently accompanied by highly significant increases in serum cholesterol levels. Groover (1958), however, showed that men studied showed no marked increase in serum cholesterol after emotional stress. Wolf (1962) produced evidence that emotional tension alone can elevate serum cholesterol up to 35 mg per cent in 1 hr. Grundy and Griffin (1959b) in a study of students taking examinations, found that mental stress caused an increase in serum cholesterol levels.

Obviously, stress needs to be defined more clearly. The present study is concerned with anxiety as a personality trait, rather than situational stress of a transitory nature. Personality anxiety is usually measured by some pencil and paper test. To select subjects in this study, two such tests were used: the Taylor Manifest Anxiety Scale (1953) and the IPAT Anxiety Scale (1959).

Scheier and Cattell (1961) report of correlation of .82 and .85 between the two tests. Harvey (1963), with 332 college men in a study relating anxiety and cardiovascular efficiency, reported a correlation of .71 between the MAS and the IPAT. Similar studies supported the high correlation of these anxiety scales. (Rosenthal, 1955; Bendig, 1959).

Subjects

For the first part of the study, 23 college-aged males were used who scored either very high or very low on both anxiety scales. The second part of the study used 50 randomly selected male students.

Procedure

The MAS and the IPAT were administered to 332 men on the first day of a winter quarter. All tests were administered under similar conditions and instructions were the same for each group of men tested. No subject was asked to participate in the research unless he had scored in the extreme ranges on both of the anxiety scales. The range in scores for the high anxious group was from 21 through 38 (Mn, 27.1) on the MAS and 37 through 62 on the IPAT (Mn, 45.3). For the low anxious group the MAS scores were 2 through 7 (Mn, 6.85) and the IPAT scores were 3 through 16 (Mn, 9.13). The possible range on the MAS is from 0 to 50 and from 0 to 80 on the IPAT.

The screening of the subjects to determine high and low anxiety groups was the primary task of the administration of the two anxiety scales. Of the original 332 students tested, 52 rated high or low on both the MAS and IPAT test. Twenty-three were available for serum cholesterol determinations. Of this 23, 10 were high anxious and 13 low anxious.

In order to further investigate the relation between personality anxiety and serum cholesterol levels, 50 randomly selected college men were given the IPAT Anxiety Scale. Immediately following the administration of this scale a blood sample was taken and duplicate cholesterol determinations done on the split sample. A product moment coefficient of correlation was computed between cholesterol levels and anxiety scores. The cholesterol determinations were done using the Lieberman-Burchart reaction. The method was an adaptation of Caraway and Fanger (1955). An analysis of the intrinsic error of the procedure was performed to determine reproducibility. On 50 identical samples, a standard deviation of 5mg/100ml was found.

Results and Discussion

The mean cholesterol level of the High Anxiety group was 202.0 (S. D., 21.6) and that of the Low Anxiety group

was 199.6 (S. D., 27.9), the difference being 2.4mg/100cc. As might be expected from the small difference, neither the "t" test (.231) nor the Kruskal-Wallis test (.899) shows a significant difference between the means of the two extreme groups.

The "r" of .003 between MAS scores and total serum cholesterol levels also indicates no relationship, nor does the "r" of .105 between the IPAT scores and total serum cholesterol.

The randomly selected group of 51 subjects showed a mean cholesterol level of 204.313mg/100cc and varies little from the mean level for the extreme groups taken together. This level is considered normal for college-aged men.

The mean IPAT anxiety score (28.65) agrees with average means obtained on other groups of college men. The "r" of .0429 between IPAT scores and serum cholesterol levels indicates no significant relationship. This correlation coefficient substantiates the results obtained for the two extreme groups.

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Note

1. This study was in part supported by funds from the Portage County Heart Association.