Abstract

Study objective—To assess the prevalence and the extent of treatment of varicose veins in a Finnish population.

Design—A prevalence study in a defined cohort was performed by using a mailed questionnaire. The method’s validity was tested in a random sample of 166 individuals who were studied clinically.

Subjects—In 1989 a questionnaire was mailed to every resident born in 1929, 1939, and 1949 who was living in Tampere, the second largest town in Finland. The eligible population comprised 3284 men and 3590 women.

Measurements and main results—The response rate was 75% in men and 86% in women. Both the sensitivity and specificity of the self assessed diagnosis were 0.92. The lifetime prevalence of varicose veins was 18% for men and 32% for women, with an increasing prevalence in relation to age. Twenty five percent of the men and 41% of the women reported varicose veins who had received treatment.

Conclusions—Self reporting of varicose veins by mailed questionnaire was a relatively valid method. The prevalence of varicose veins was high in the population studied, and the disease is more common in women than men. Moreover, the prevalence increased with age. The results are comparable with other western populations. Preventive methods are needed because treatment alone seems to be inadequate in the control of varicose veins.

Varicose veins are a common disorder in western populations but the causes remain largely unknown. Raised venous pressure or a primary structural weakness in the vein wall have been considered essential in the pathogenesis of varicose veins.

The occurrence of varicose veins in populations varies. The data are mainly derived from cross sectional studies, but follow up studies have also been conducted. In these studies the prevalence of varicose veins in adults varied from 7 to 38% in men and from 14 to 51% in women. The two year incidence proportion of varicose veins was reported to be 39 per 1000 men and 52 per 1000 women (40–89 years of age). Varicose veins are associated with other symptoms in the legs and they result in extensive need of treatment. Subsequently, operations for varicose veins cause a considerable burden to surgical departments.

Because there are no extensive studies on the prevalence of varicose veins in Finland and in other Nordic countries, knowledge of their occurrence and determining factors is lacking. We therefore undertook a cross sectional study of the occurrence of varicose veins in a Finnish population.

Methods

All people born in 1929, 1939, and 1949 and resident in Tampere, a city in southern Finland with 171 307 inhabitants (in 1989), were identified from the National Population Registry in 1989, and their addresses were received from the same registry. These 3284 men and 3590 women formed the study population. In September 1989 they were sent a questionnaire in which they were asked to indicate if they had ever had varicose veins. Varicose veins were defined as “clearly visible, dilated, tortuous, and possibly prominent subcutaneous veins of the lower extremities” according to a definition used in other epidemiological surveys of varicose veins. By definition, telangiectasia were not taken as varicose veins. The severity of the varicose veins was not graded further. The subjects were also asked about any surgery or sclerotherapy treatment for varicose veins. An identical questionnaire was mailed one to two months later to those who had not responded to the first questionnaire.

The prevalence of varicose veins was defined as the proportion of subjects who reported having had varicose veins during their lifetime in relation to all respondents (lifetime prevalence). Unless otherwise stated, the reported proportions are the actual observed prevalences based on self reporting. Adjustments for non-response and misclassification were also attempted. The adjustment for the bias caused by non-response was approximated by extrapolating linearly the prevalence of the non-responding group from the proportional changes in the prevalences among the subgroups who responded to the first and reminder questionnaires. The effect of misclassification on the prevalence of varicose veins was adjusted for by using the formula:

\[ P^\prime = \frac{P - (1 - Sp)}{(1 - Se) - (1 - Sp)} \]

where \( P^\prime \) is the adjusted prevalence, \( P \) observed prevalence based on self reporting, and \( Sp \) and \( Se \) the observed values for specificity and sensitivity of the self assessed diagnosis.

The accuracy of self assessed diagnosis was estimated in a blinded study of 166 randomly sampled respondents born in 1939. The self evaluations were compared with the clinical

J Epidemiol Community Health 1993; 47: 355–357

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Accepted for publication
May 1993

Varicose veins in a Finnish population aged 40–60

Jari Laurikka, Tero Sisto, Ossi Auvinen, Matti Tarkka, Esa Lääärä, Matti Hakama
The observed prevalences of varicose veins in the subpopulations who responded to the first and the repeated questionnaires differed only in men: the prevalences were substantially higher in those who responded to the first questionnaire (13 vs. 7, 24 vs. 17%, and 24 vs. 7% in the 40, 50, and 60 year olds, respectively). In the women the prevalences in the corresponding ages were (the first vs. the second questionnaire) 31 vs. 28%, 45 vs. 50%, and 55 vs. 52%.

The observed original prevalences were adjusted for the effects of non-response. Furthermore, the observed prevalences were adjusted for the effects of misclassification by using the estimated specificity and sensitivity (Table V).

**Discussion**

Varicose veins are fairly common in Finland (which has a population of five million). According to original data from the National Agency for Welfare and Health, approximately 11 000 varicose vein operations are performed each year in general hospitals in Finland. No epidemiological data, however, on varicose veins in Finland have been published to date.

The study population was from an urban area in the south of Finland with a fairly homogenous ethnic composition. No published data exist about the potential differences in the prevalences of varicose veins in urban and rural parts of Finland.

The response rate in our study was high, especially in women. The occurrence of varicose veins in men seemed to be associated with response to the questionnaire. The questionnaire method used in this study proved to be fairly accurate in measuring the prevalence of clinically important varicose veins in a moderately large study population. The estimated specificity and sensitivity of the questionnaire method in identifying subjects with varicose veins were reasonably high. In some previous studies the accuracy of self-reporting of chronic conditions (including varicose veins) has typically been lower.17 A similar specificity (85–95%) but a lower sensitivity (47–67%) was reported in an interview study in

### Table I

<table>
<thead>
<tr>
<th>Diagnosis by the surgeon</th>
<th>No of men</th>
<th>No of women</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>VV</td>
<td>14</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>No. VV</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>All</td>
<td>19</td>
<td>5</td>
<td>24</td>
</tr>
</tbody>
</table>

**Table II**  
Response rate in the three birth cohorts in relation to gender

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Total population</th>
<th>Participation rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Male</td>
<td>1499</td>
<td>76.5</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1489</td>
<td>85.2</td>
</tr>
<tr>
<td>50</td>
<td>Male</td>
<td>980</td>
<td>76.5</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1060</td>
<td>88.0</td>
</tr>
<tr>
<td>60</td>
<td>Male</td>
<td>805</td>
<td>82.0</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1041</td>
<td>86.4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6574</td>
<td>81.0</td>
</tr>
</tbody>
</table>

**Table III**  
Self assessment of ever having varicose veins (VV); proportions of individuals (%) by age and gender

<table>
<thead>
<tr>
<th>Gender and age (y)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Participation rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>All</td>
</tr>
<tr>
<td>Certain of VV</td>
<td>12</td>
<td>3</td>
<td>18</td>
<td>31</td>
</tr>
<tr>
<td>Uncertain of VV</td>
<td>23</td>
<td>1</td>
<td>24</td>
<td>45</td>
</tr>
<tr>
<td>Definitely no VV</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table IV**  
Number (%) of individuals who reported having varicose veins (VV) ever and at time of the study and the reported history of treatment for varicose veins

<table>
<thead>
<tr>
<th>Gender and age (y)</th>
<th>Male</th>
<th>Female</th>
<th>Total population</th>
<th>Participation rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>All</td>
</tr>
<tr>
<td>Reporting VV ever</td>
<td>12</td>
<td>24</td>
<td>31</td>
<td>45</td>
</tr>
<tr>
<td>Reporting VV at time of the study</td>
<td>23</td>
<td>15</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Reporting treatment</td>
<td>31</td>
<td>20</td>
<td>51</td>
<td></td>
</tr>
</tbody>
</table>

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The observed prevalences of varicose veins in the subpopulations who responded to the first and the repeated questionnaires differed only in men: the prevalences were substantially higher in those...
varicose veins in Finland

Israel. In the present study, the adjustments for the effects of both selection (as a result of non-
response) and misclassification yielded somewhat smaller prevalences than those based on self-
reporting among those who responded.

The prevalence of varicose veins was also com-
parable with the findings obtained from studies on
other white populations. Apart from chance, the
observed differences in the prevalences between
this study and other studies may, for example, be
due to differences in diagnostic criteria. In this
study, the prevalence of varicose veins in women
was 2.3 times that in men, and the finding was
consistent with other reports showing prevalence
ratios of 2.0, 2.8, and 1.3.

In the study population the prevalence was
lowest in the youngest cohort in both sexes.
However, varicose veins may develop at any age
after adolescence. The results of the Framingham
Study from a population with the minimum age of
40 years have indicated that the incidence of
varicose veins varies by age with the highest
incidence rates being found in men aged 70–79
and in middle aged (40–49 years) women.

Although our study did not include people older
than 60 years, these results, especially for women,
agree with those obtained in the Framingham
Study.

Treatment for varicose veins was common in
the older people but was infrequent among
younger men. The proportion of treated cases
clearly increased with age. The reasons for treat-
ment or abstaining from treatment were not
evaluated. Similarly, the pathophysiologic
extent of the varicose disease was unknown.
Therefore, individuals with no treatment may
have had the least severe form of varicosis.
A history of previous treatment for varicose veins
had no substantial effect on the actual occurrence
of all forms of varicose veins at the time of the
study, even though in Tampere, according to the
hospital discharge records, the treatment rate for
varicosis has exceeded the rate observed in the rest
of the country.

A relatively high proportion (50 to 80%) of
people had not been given any treatment for their
varicose veins. In spite of this, the alleviating
effects of the treatment on the symptoms or signs

of varicosis could still have been considerable in
many of those treated individuals but it was not
possible to evaluate this in our survey.

In conclusion, varicose veins are common in
middle aged Finnish people and were reported
especially often by women. When compared with
other nationalities, varicose veins affect Finns to a
similar extent. Curative treatment was possible in
a minority of individuals with varicosis. Therefore,
preventive measures could be beneficial and the
main risk factors of varicosis need to be studied
further.

2 King ESJ. The genesis of varicosis. Ann N Y Acad
4 Coon WW, Willis PW, Keller JB. Venous thromboembolism and other venous diseases in the Tecumseh
5 Bobek K, CajiJ, Cepelak V, Staniova V, Opatsny K, Barcel R. Etude de la fréquence des maladies phlébitiques et
7 Beaglehole R, Prior IAM, Salmond CE, Davidson F. Varicose veins in the South Pacific. Int J Epidemiol 1975; 4:
295–9.
10 Brand FN, Dannenberg AL, Abbott RD, Kannell WB. The epidemiology of varicose veins: the Framingham study. Am
11 Widmer LK and Wandeler JM. Leg complaints and peripheral venous disorders. In: Widmer LK, ed. Peripheral
13 Madhota SL. An epidemiological study of varicose veins in Indian railroad workers from the south and north of India,
15 Gaswirth JL. The statistical precision of medical screening procedures: Application to polygraph and AIDS antibodies
16 Garber MJ, Altman DG. Calculating confidence intervals for proportions and their differences. In: Gardner MJ,
17 Cannell GF. A summary of studies of interviewing methodology. In: Data evaluation and methods research.
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*J Epidemiol Community Health* 1993 47: 355-357
doi: 10.1136/jech.47.5.355

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