High total serum cholesterol, medication coverage and therapeutic control: an analysis of national health examination survey data from eight countries

Gregory A Roth,1 Stephan D Fihn,2 Ali H Mokdad,3 Wichai Aekplakorn,4 Toshihiko Hasegawa5 & Stephen S Lim6

Objective To determine the fraction of individuals with high total serum cholesterol who get diagnosed and effectively treated in eight high- and middle-income countries.

Methods Using data from nationally representative health examination surveys conducted in 1998–2007, we studied a probability sample of 79,039 adults aged 40–79 years from England, Germany, Japan, Jordan, Mexico, Scotland, Thailand and the United States of America. For each country we calculated the prevalence of high total serum cholesterol (total serum cholesterol ≥ 6.2 mmol/l or ≥ 240 mg/dl) and the mean total serum cholesterol level. We also determined the fractions of individuals being diagnosed, treated with cholesterol-lowering medication and effectively controlled (total serum cholesterol < 6.2 mmol/l or < 240 mg/dl).

Findings The proportion of undiagnosed individuals was highest in Thailand (78%; 95% confidence interval, CI: 74–82) and lowest in the United States (16%; 95% CI: 13–19). The proportion being treated who had attained evidence of control ranged from 9% in Thailand (95% CI: 8–11) to 53% in Japan (95% CI: 50–57). The proportion being treated who had attained evidence of control ranged from 4% in Germany (95% CI: 3–5) to 58% in Mexico (95% CI: 54–63). Time series estimates showed improved control of high total serum cholesterol over the past two decades in England and the United States.

Conclusion The percentage of people with high total serum cholesterol who are effectively treated remains small in selected high- and middle-income countries. Many of those affected are unaware of their condition. Untreated high blood cholesterol represents a missed opportunity in the face of a global epidemic of chronic diseases.

Introduction

Cardiovascular disease caused over 18 million deaths in the world in 2005.1 Of these deaths, eight million (44%) occurred in people under 60 years of age and 80% took place in low- and middle-income countries.2,3 In response, the World Health Organization (WHO) has set a goal of reducing the global rate of death from chronic diseases by 2% a year up to 2015.4 This goal rests on the recognition that throughout the world deaths from cardiovascular causes are attributable to a few modifiable risk factors, most importantly high blood pressure, smoking and high total serum cholesterol.4,5

Lowering total serum cholesterol levels is an ideal strategy for reducing the burden of cardiovascular disease. Potent, safe and highly effective cholesterol-lowering medication is available in the form of statins,6 and there are many low-cost methods for identifying those who need to lower their serum cholesterol.7,8 Modelling studies suggest that lowering total serum cholesterol, either by treating elevated total serum cholesterol alone or by managing multiple risk factors, is cost-effective in many low- and middle-income countries.9

While the use of cholesterol-lowering medication is considered important in reducing the burden of cardiovascular disease, differences in the way various health systems are implementing this strategy are not well understood.10,11 Comparing individual studies is difficult because the definition of a high blood cholesterol level varies among studies and, until recently, population-wide data has been lacking for many places. The growing number of national health examination surveys that measure total serum cholesterol provides an opportunity to ascertain how well cholesterol-lowering medication is being delivered to populations at risk of cardiovascular disease.12 Using microdata from multiple national health examination surveys in eight countries, we have estimated the proportion of the population diagnosed with high total serum cholesterol, on treatment with cholesterol-lowering medication, and with evidence of therapeutic control.

Methods

Search strategy

In 2008, we systematically searched the following for nationally representative health examination surveys performed since 1997: Google Scholar and PubMed (using relevant keywords), the WHO Global Infobase,13 the WHO STEOptwise approach to surveillance database14 and the European Health Interview Surveys and Health Examination Surveys database.15 We identified surveys that measured total serum cholesterol and that asked respondents if they used cholesterol-lowering medication. Individual-level data was downloaded from agency web...
sites when publicly available or obtained through formal application procedures and by contacting study authors.

**Survey characteristics**

The following national health examination surveys met our criteria: Germany (1998), Japan (2000), Scotland (2003), Thailand (2004), the United States of America (2005–2006), England (2006), Mexico (2006) and Jordan (Jordan Ministry of Health, unpublished data, 2007).16–22 Our study included five high-income countries, one upper-middle-income country and two lower-middle-income countries. Table 1 shows the year in which the surveys were conducted, the questions used in these surveys for the self-reported diagnosis of high total serum cholesterol and the self-reported use of cholesterol-lowering medication. Most surveys did not differentiate between prescribed and over-the-counter medications or between statin and non-statin medication.

Enzyme-based automated methods were used in all surveys to measure total serum cholesterol levels. The guidelines of the United States Centers for Disease Control and Prevention and WHO were followed in all countries except Germany and Thailand, where national guidelines were observed. Blood tests were performed in a central laboratory in all countries except Thailand, which relied on five regional university laboratories.

### Table 1. **Assessment of high total serum cholesterol and use of cholesterol-lowering drugs among respondents of national health examination surveys in eight countries, 1998–2007**

<table>
<thead>
<tr>
<th>Country</th>
<th>Survey year</th>
<th>Diagnostic question</th>
<th>Determination of medication use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>1998</td>
<td>The last time your blood cholesterol level was measured, were you told it was high?</td>
<td>Nurse manually reviews pills.</td>
</tr>
<tr>
<td>Japan</td>
<td>2000</td>
<td>Have you ever been told by a medical doctor that your serum cholesterol is high?</td>
<td>Do you take medication to lower total serum cholesterol?</td>
</tr>
<tr>
<td>Scotland</td>
<td>2003</td>
<td>Thinking about the last time your blood cholesterol level was measured, were you told it was higher than normal?</td>
<td>Nurse manually reviews pills.</td>
</tr>
<tr>
<td>Thailand</td>
<td>2004</td>
<td>Has a medical doctor told you that you had hypercholesterolaemia in the last year?</td>
<td>Have you used a cholesterol-lowering drug in the last 2 weeks?</td>
</tr>
<tr>
<td>United States</td>
<td>2005–06</td>
<td>Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?</td>
<td>Have you ever been told by a doctor or other health professional to take a prescribed medicine to lower your blood cholesterol? Are you now following this advice to take prescribed medicine?</td>
</tr>
<tr>
<td>England</td>
<td>2006</td>
<td>Thinking about the last time your blood cholesterol level was measured, were you told it was high?</td>
<td>Nurse manually reviews pills.</td>
</tr>
<tr>
<td>Mexico</td>
<td>2006</td>
<td>Has any doctor said you have high cholesterol?</td>
<td>Have you been treated for high cholesterol with drugs?</td>
</tr>
<tr>
<td>Jordan</td>
<td>2007</td>
<td>Have you ever been told by a health facility that your blood cholesterol is high?</td>
<td>Are you currently taking medicine for your high blood cholesterol?</td>
</tr>
</tbody>
</table>

* These countries belong to different World Bank income categories.

### Definitions

For each country, we calculated mean total serum cholesterol and the prevalence of high total serum cholesterol, conservatively defined as ≥ 6.2 mmol/l (240 milligrams per decilitre, mg/dl), for adults from 40 to 79 years of age. To determine whether countries are delivering cholesterol-lowering medication and effectively lowering blood cholesterol levels, we assigned all individuals with high total serum cholesterol to one of four mutually exclusive categories: undiagnosed, diagnosed but untreated, treated but not controlled, and treated and controlled. A person considered “undiagnosed” was one who reported never having been given a diagnosis of high total serum cholesterol but whose total serum cholesterol as measured during the survey was ≥ 6.2 mmol/l. A person considered “diagnosed but untreated” was one who reported having been diagnosed with high blood cholesterol, who had a total serum cholesterol level ≥ 6.2 mmol/l during the survey and who did not report using cholesterol-lowering medication. A person considered “treated but not controlled” was one who reported using cholesterol-lowering medication but whose total serum cholesterol during the survey was ≥ 6.2 mmol/l. A person considered “treated and controlled” was one who reported using cholesterol-lowering medication and whose total serum cholesterol during the survey was < 6.2 mmol/l.

### Statistical analysis

We used the `svy` command in Stata, release 10 (StataCorp LP, College Station, United States of America) to analyse individual-level data taking into account the complex survey design and applying sample weights for each survey. Missing data were handled by listwise deletion.23 We estimated the total population with high total serum cholesterol in each country (including individuals using lipid-lowering medication) by multiplying the age- and sex-specific prevalence figures from each survey by the age- and sex-specific population estimates from the United Nations Population Division for each survey year.23 To standardize our figures for medication delivery by age and sex we used the population aged 40–79 years with high total serum cholesterol pooled across all surveys. This was done to ensure a standard population that reflected the rightward shift in age structure of the population with high total serum cholesterol levels. We converted total serum cholesterol levels from milligrams per decilitre to millimoles per litre, as prescribed by the International System of Units, using a conversion factor of 0.02586.25 Sensitivity analyses were performed for different definitions of high total serum cholesterol, including total serum cholesterol values of 5.0, 5.2 and 6.5 mmol/l.

For countries with sufficient data (England and the United States) we compared secular trends in diagnosis, medica-
tion coverage and control. Data from the National Health and Nutrition Examination Survey III (NHANES) of the United States, conducted from 1988 to 1994, are shown in Fig. 1 as a time point for 1993 and treated as a comparator for the 1993 Health Survey time point for 1993 and treated as a comparator for the 1993 Health Survey for England. To account for possible variation in age structure between these countries over time, we age-standardized these time series cross-sectional rates to the hypercholesterolaemic population aged 40–79 years of the United States. The United States National Health and Nutrition Examination Survey III, represented here as a time point for 1993, was conducted from 1988 to 2004.

This analysis received a certificate of exemption from the Institutional Review Board at the University of Washington in Seattle, United States (HSD No. 35660).

Results

The eight surveys included in this analysis provided a representative probability sample from a multi-country population of approximately 147 000 000 individuals with high total serum cholesterol. Table 2 shows, for each survey, the country in which it was conducted, the country’s World Bank income class, sample size, mean total serum cholesterol and the size of the population with hypercholesterolaemia. We were unable to calculate measures of central tendency for the Mexican survey because total cholesterol < 3.88 mmol/l was reported as a level equal to 3.88 mmol/l in the data set.

Mean total serum cholesterol ranged from 5.06 mmol/l (SD 0.07) in Jordan to 6.46 mmol/l (SD 0.02) in Germany. The prevalence of a total serum cholesterol ≥ 6.2 mmol/l or the use of cholesterol-lowering medication ranged from 19.2% (95% confidence interval, CI: 17.3–21.2) in Mexico to 61.6% (95% CI: 59.0–64.2) in Germany. Fig. 2 shows the mean total serum cholesterol levels and their 95% CIs, stratified by age and sex. Mean total serum cholesterol levels were significantly higher for younger men in England, Germany and Japan and for older women in England, Japan, Scotland and the United States.

The proportion of individuals who were diagnosed, treated with cholesterol-lowering medication and successfully controlled, stratified by age and sex. The prevalence of undiagnosed high total serum cholesterol decreased with age in England, Japan and Scotland in both men and women, and only in men in the United States. These differences reached statistical significance in England for both sexes, and in Scotland for men. The prevalence of undiagnosed high total serum cholesterol differed significantly by sex for all age categories in Scotland and for individuals 55–79 years of age in England. The proportion of individuals who were diagnosed but untreated decreased with age in all countries except Germany, Jordan and Mexico. The proportion of individuals who were treated and achieved evidence of control increased with age in England among men and women and in Japan, Scotland and the United States among men alone. Control rates differed significantly by sex for all age groups in England and for individuals 55–79 years of age in Scotland.

Trends over time

Secular trends in England and the United States demonstrated a decline during the past two decades in the proportion of men and women with undiagnosed high total serum cholesterol (Fig. 1). In England, the decline in males was from 61.9% (95% CI: 59.5–64.2) to 42.4% (95% CI: 39.3–45.5), and in females it was from 75.1% (95% CI: 73.3–77) to 53% (95% CI: 50.2–56). Rates fell more gradually in the United States. In males, the proportion dropped from 30.4% (95% CI: 26.4–34.5) to 25.1% (95% CI: 22.5–28.7), and in females it fell from 33.0% (95% CI: 29.0–37.0) to 26.5% (95% CI: 20.6–32.5). In both countries, the proportion of individuals diagnosed but untreated decreased, whereas the proportion who achieved therapeutic control increased steadily. In England in 2006, 35.5% of men (95% CI: 32.8–38.3) and...
25.7% of women (95% CI: 23.4–28.1) with high total serum cholesterol were on cholesterol-lowering medication and had achieved good control, as opposed to 0.6% of men (95% CI: 0.3–1.3) and 0.4% of women (95% CI: 0.1–0.7%) in 1993. In the United States in 2006, 54.0% of men (95% CI: 47.6–60.4) and 49.7% of women (95% CI: 44.3–55.0) with high total serum cholesterol were on cholesterol-lowering medication and had evidence of control, as opposed to 10.8% of men (95% CI: 8.0–13.6) and 8.6% (95% CI: 6.7–10.6) of women in 1993. The proportion of individuals who were treated but uncontrolled remained essentially unchanged after 1993 in both England and the United States: 2.6% (95% CI: 1.9–3.2) and 9.1% (95% CI: 5.9–12.2), respectively.

**Sensitivity analysis**

The cut-off value of total serum cholesterol that we used to diagnose hypercholesterolaemia and to define therapeutic control (6.2 mmol/l) was highly conservative. In essence, we assumed that any elevated blood cholesterol level below this cut-off represented the effect of lipid-lowering medication among those who were on treatment for very high total serum cholesterol. As shown in Appendix A (available at: http://www.healthmetricsandevaluation.org/data/2010/national_health/Webappendix_1.pdf), when we dropped the cut-off value to 5.2 mmol/l, our estimated proportion of individuals on treatment who were adequately controlled decreased by approximately 50%. As expected, coverage estimates are highly sensitive to the definition of disease state and treatment goals.

**Discussion**

Our study reveals that in countries with different income levels, a large proportion of individuals who would benefit from cholesterol-lowering medication remain unaware of this opportunity to reduce their risk for cardiovascular disease, or they remain untreated despite being aware of their condition. For instance, the limited use of cholesterol-lowering medication in Jordan and Thailand is alarming because high serum cholesterol is common among adults in both countries. These findings support the growing recognition that cardiovascular diseases are not merely “diseases of...”

<table>
<thead>
<tr>
<th>Country</th>
<th>Income category</th>
<th>Total serum cholesterol in adults aged 40–79 years with high total serum cholesterol</th>
<th>%</th>
<th>95% CI</th>
<th>No. surveyed adults</th>
<th>Mean (mmol/l) ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>High</td>
<td>4.26 ± 0.02</td>
<td>61.6</td>
<td>59.0–64.2</td>
<td>4100000.00</td>
<td>6.46 ± 0.02</td>
</tr>
<tr>
<td>Japan</td>
<td>High</td>
<td>6.43 ± 0.02</td>
<td>23.7</td>
<td>21.8–25.5</td>
<td>2250000.00</td>
<td>5.35 ± 0.02</td>
</tr>
<tr>
<td>Scotland</td>
<td>High</td>
<td>5.14 ± 0.03</td>
<td>42.6</td>
<td>39.7–45.6</td>
<td>1665917.00</td>
<td>5.86 ± 0.03</td>
</tr>
<tr>
<td>Thailand</td>
<td>Lower middle</td>
<td>26.89 ± 0.04</td>
<td>27.7</td>
<td>24.2–30.3</td>
<td>10600000.00</td>
<td>5.34 ± 0.04</td>
</tr>
<tr>
<td>United States</td>
<td>High</td>
<td>26.62 ± 0.04</td>
<td>23.7</td>
<td>21.7–25.7</td>
<td>4670000.00</td>
<td>5.34 ± 0.04</td>
</tr>
<tr>
<td>England</td>
<td>High</td>
<td>8.63 ± 0.02</td>
<td>35.2</td>
<td>32.3–38.1</td>
<td>1470000.00</td>
<td>5.02 ± 0.02</td>
</tr>
<tr>
<td>Mexico</td>
<td>Upper middle</td>
<td>1.82 ± 0.07</td>
<td>19.2</td>
<td>17.2–21.2</td>
<td>900000.00</td>
<td>5.07 ± 0.07</td>
</tr>
<tr>
<td>Jordan</td>
<td>Lower middle</td>
<td>21.62 ± 0.07</td>
<td>10.2</td>
<td>8.7–11.7</td>
<td>686212.00</td>
<td>5.36 ± 0.07</td>
</tr>
</tbody>
</table>

CI, confidence interval; NA, not available; SD, standard deviation. Data derived from national health examination surveys conducted from 1998 to 2007.
affluence" and that some middle-income countries are beginning to face a double burden of both chronic and communicable diseases.26,27

Effective delivery of cholesterol-lowering medication has increased threefold in England and fivefold in the United States over the past two decades. Our analysis suggests that this is associated with the increased use of medication among the diagnosed population rather than an increase in the fraction of the population that is diagnosed. Thus, efforts to screen more people and make them aware of their high serum cholesterol levels have been less successful than efforts to deliver treatment to those who know they are hypercholesterolaemic.

England, in particular, appears to have made rapid gains in the therapeutic coverage and control of people with high serum cholesterol during a time when barriers to treatment have decreased. In the United Kingdom of Great Britain and Northern Ireland, patent protection for simvastatin expired in May 2003 and over-the-counter simvastatin became available in July 2004.24 This contrasts sharply with the situation in Thailand, where in 2004 simvastatin was found in fewer than 5% of pharmacies.25 The past decade has seen significant changes in the global availability of simvastatin in particular. There are now over 100 manufacturers of this potent cholesterol-lowering medication, including many in China and India.26 In 2007, the drug

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**Fig. 2.** Mean total serum cholesterol, by age group and sex, in seven countries (Mexico excluded)* with different income levels, 1998–2007

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**Fig. 3.** Diagnosis, treatment and control of high total serum cholesterol in the population aged 40–79 years in eight countries with different income levels, 1998–2007*
was added to the WHO’s list of essential medicines. In some regions, treatment with simvastatin (40 mg) and with lovastatin (20 mg) costs less than US$ 30 and US$ 3 per year, respectively. These changes have probably led to improved adherence to statins, as well as to broader screening and prescribing.

The guidelines for screening and for the treatment of people with high serum cholesterol show variations that warrant further mention. For instance, medication coverage and therapeutic control increase significantly with advancing age and are higher among males than among females in England and Scotland, where screening and treatment guidelines have remained, until recently, relatively conservative. In contrast, rapid gains in lowering serum cholesterol were seen in the United States following the publication of the 1993 Adult Treatment Panel recommendation to use low-density lipoprotein (LDL) as a primary measure of cholesterol and to target a level < 2.6 mmol/l (100 mg/dl) among those with elevated cardiovascular risk. Unfortunately, any analysis of the effect of treatment guidelines is confounded by the fact that physicians in certain countries have been shown to rely on differing guidelines, including those from other countries. Further work is required to determine the effect of cholesterol screening policy and of guidelines on the delivery of cholesterol-lowering medication.

Most surprising perhaps is the high medication coverage seen in Mexico. Although it is encouraging, its cause is unclear. The direct benefits of health reform efforts conducted in the past decade by the Mexican government have been difficult to establish. Cross-national comparisons among developing countries with similar disease burdens can reveal striking differences in health system investment. For example, Mexico and Thailand are similar in population size and in the prevalence of high serum cholesterol. However, Mexico invests more than twice as much as Thailand in physicians per capita, whereas Thailand spends twice as much as Mexico on medications. To further understand medication coverage in Mexico and indeed in all countries, more research into how health resources are allocated by governments to curb cardiovascular diseases is required.

**Strengths and limitations**

Our analysis is based on several nationally-representative surveys of individuals with high serum cholesterol. Previous multinational comparisons have relied on subnational surveys conducted around selected urban areas and may have overestimated true intervention coverage. Our results are in line with prior estimates from country-level surveys in Mexico and Germany.

This analysis has several limitations. To assess diagnosis and medication use we relied on self-reported responses whose validity, reliability and comparability are unknown. All surveys enquired about a previous diagnosis of high blood cholesterol and medication use, but the phrasing of the questions was not iden-
Available data often came from different time periods. Because it was not possible to adjust for these differences, comparisons across countries may be confounded. These issues highlight the need to standardize health examination surveys to allow for more robust comparisons across countries and more frequent comparisons across time. We had to limit our analysis to total serum cholesterol because this was the only biomarker common to all surveys. Total serum cholesterol is a reliable indicator of elevated blood lipid levels because it correlates highly ($r > 0.9$) with LDL but is less susceptible than LDL to the effects of recent meals. Despite this, total serum cholesterol measurements overestimate cardiovascular risk by ignoring the protective effect of high-density lipoprotein (HDL) in people with high total serum cholesterol.

Following previous cross-country comparisons of population levels of high total serum cholesterol, we defined high total serum cholesterol as a serum level of total cholesterol ≥ 6.2 mmol/l (240 mg/dl). This cut-off level is considerably higher than optimal, but it is one at which most guidelines would consider medication therapy appropriate. Thus, it allowed us to cover all individuals who could reasonably be expected to receive cholesterol-lowering medication. The association between blood cholesterol levels and cardiovascular risk is curvilinear. Thus, it is not possible to adjust for these differences, different time periods. Because it was not possible to adjust for these differences, comparisons across countries may be confounded. These issues highlight the need to standardize health examination surveys to allow for more robust comparisons across countries and more frequent comparisons across time. We had to limit our analysis to total serum cholesterol because this was the only biomarker common to all surveys. Total serum cholesterol is a reliable indicator of elevated blood lipid levels because it correlates highly ($r > 0.9$) with LDL but is less susceptible than LDL to the effects of recent meals. Despite this, total serum cholesterol measurements overestimate cardiovascular risk by ignoring the protective effect of high-density lipoprotein (HDL) in people with high total serum cholesterol.

**Recommendations**

Programmes designed to achieve higher detection and control of high blood cholesterol should be developed and implemented. Dried blood spot technology offers a new and affordable approach to screening in low-income settings. At the same time, better chronic disease surveillance is needed to monitor and guide these programmes. The standardized chronic disease modules developed as part of WHO's STEPSwise approach to surveillance are a good example, and similar modules emphasizing medication delivery require broader adoption. Finally, surveys should be repeated at regular intervals so that countries can track their progress towards achieving health goals, as England and the United States are doing. These intervention coverage metrics will play an important role in reducing the burden of chronic diseases as global goals are increased beyond the current, highly conservative goal of a 2% decrease per year.

**Conclusion**

Our findings support the growing consensus that the global burden of cardiovascular disease, which is the leading cause of death in most countries, requires immediate action. The recent announcement of a Global Alliance for Chronic Disease is heartening and suggests that the global burden of cardiovascular diseases is beginning to be viewed with the same urgency formerly reserved for infectious diseases. Cholesterol-lowering medication is widely available, highly effective, and can play an essential role in reducing cardiovascular disease around the world. Despite these facts, effective medication coverage for control of high cholesterol remains disappointingly low.

**Acknowledgements**

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**Competing interests:** None declared.
High cholesterol and its treatment in eight countries

Aim
To determine the proportion of people with high serum total cholesterol who were diagnosed and treated effectively in eight middle- and high-income countries.

Methods
Using data from national representative surveys of health examinations conducted from 1998 to 2007, we studied a probability sample of 79,039 adults aged 40 to 79 years from England, Germany, Jordan, Mexico, Scotland, Thailand, and the United States of America. For each country, we calculated the prevalence of high serum total cholesterol (serum total cholesterol ≥ 6.2 mmol/l or ≥ 240 mg/dl) and the average serum total cholesterol level. We also determined the proportions of individuals who were diagnosed with high cholesterol, treated with cholesterol-lowering drugs, and had their condition effectively controlled (serum total cholesterol < 6.2 mmol/l or < 240 mg/dl).

Results
In Thailand, the proportion of people who were not diagnosed was highest (78%; 95% CI: 74–82), and in the United States, it was lowest (16%; 95% CI: 13–19). The proportion of people who were diagnosed but not treated varied from 9% in Thailand (95% CI: 8–11) to 53% in Japan (95% CI: 50–57). The proportion of individuals under treatment who had effectively improved was 4% in Germany (95% CI: 3–5) to 58% in Mexico (95% CI: 54–63). Time-series estimates showed improvements in the last two decades in England and the United States.

Conclusion
In the selected middle- and high-income countries, the proportion of people with high serum total cholesterol and effectively treated remains low. Many patients are unaware of their condition. Uncontrolled high serum cholesterol is an opportunity missed in the prevalence of chronic diseases globally.
Resumen

Concentración sérica de colesterol elevada, cobertura farmacéutica y control terapéutico: análisis de los datos de las encuestas nacionales de vigilancia sanitaria procedentes de ocho países

Objetivo Determinar la fracción de individuos diagnosticados con una concentración sérica elevada de colesterol total y que hayan recibido un tratamiento eficaz en ocho países de ingresos medidos y elevados.

Métodos Con los datos de las encuestas de vigilancia sanitaria, representativas a nivel nacional y realizadas entre 1998 y 2007, se estudió una muestra basada en la probabilidad de 79 039 adultos con edades comprendidas entre los 40 y 79 años en Alemania, Escocia, Estados Unidos de América, Inglaterra, Japón, Jordania, México y Tailandia. Se calculó la prevalencia de la hipercolesterolemia (colesterol sérico total ≥6,2 mmol/l o ≥240 mg/dl) y el nivel medio de colesterol sérico total para cada país. También se determinaron las fracciones de individuos que fueron diagnosticados y tratados con hipocolesterolemicadores y controlados eficazmente (colesterol sérico total <6,2 mmol/l o <240 mg/dl).

Resultados La proporción de individuos sin diagnosticar fue mayor en Tailandia (78%); intervalo de confianza del 95%, (IC: 74-82) y menor en los Estados Unidos de América (16%; IC del 95%; 13-19). La fracción de personas diagnosticadas que no recibieron tratamiento varió entre el 9% de Tailandia (IC del 95%: 8-11) y el 53% de Japón (IC del 95%: 50-57). La proporción de pacientes en tratamiento, con resultados que evidenciaban haber conseguido controlar la enfermedad, osciló entre el 4% en Alemania (IC del 95%: 3-5) y el 58% en Japón (IC del 95%: 54-63). Las estimaciones de las series temporales mostraron una mejoría en el control de las concentraciones de colesterol sérico total en las últimas dos décadas en Inglaterra y los Estados Unidos.

Conclusión El porcentaje de personas con concentraciones elevadas de colesterol sérico total que reciben un tratamiento eficaz sigue siendo pequeño en los países seleccionados de ingresos medidos y elevados. Muchos de los afectados no son conscientes de su enfermedad. La hipercolesterolemia sin tratar supone una oportunidad perdida, a tenor de la epidemia mundial de las enfermedades crónicas.

References


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