Physicians Underdiagnose and Undertreat Obesity in Ischemic Heart Disease patients: Data from the HOLEM Study Group

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Abstract

Background: Obesity is an independent risk factor for ischemic heart disease and affects the status of other risk factors for cardiovascular disease.

Objective: To study the attitude of physicians to obesity by examining discharge letters of overweight patients with ischemic heart disease.

Methods: We used the HOLEM database for this analysis. The HOLEM project was designed to study the NCEP (National Cholesterol Education Program) guideline implementation among patients with IHD at hospital discharge. We documented the recording of risk factors and treatment recommendations for IHD by reviewing the discharge letters of 2944 IHD patients admitted to four central hospitals in Israel between 1998 and 2000. A follow-up visit was held 6–8 weeks after discharge, at which time the diagnosis of IHD was verified, risk factor status was checked, height and weight were measured and drug treatment was reviewed.

Results: Mean body mass index was 28.3 kg/m² and 32% were obese (BMI ≥ 30 kg/m²). Only 39.6% of the obese patients and 65.8% of the morbidly obese patients (BMI ≥ 40 kg/m²) had “obesity” noted in their discharge letters, and weight loss recommendation was written in only 15% of the obese patients’ discharge letters. Acute episodes like acute myocardial infarction and unstable angina did not influence the notation of obesity, and only BMI and the number of additional risk factors were positively correlated with the notation of this risk factor.

Conclusions: Despite the importance of obesity, weight status was not noted and weight loss was not recommended in most of the discharge letters of obese IHD patients.

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The prevalence of obesity is increasing worldwide and threatens to be a serious medical problem of the 21st century [1,2] since it is considered a risk factor for many diseases [3-7]. Not only is obesity an independent risk factor for the number one killer in the western world [8]. cardiovascular disease, it also aggravates other important risk factors for this disease [9,10].

Despite the lack of evidence for the beneficial effect of weight loss on CVD mortality and morbidity, maintaining optimal weight is important for patients with ischemic heart disease who suffer from unstable angina and/or non-Q wave myocardial infarction [11]. This lack of evidence is probably due to the beneficial effects of weight loss in reducing other risk factors for CVD.

It is therefore crucial that physicians address this issue; obese patients should be advised to achieve optimal weight in order to reduce morbidity and mortality associated with this condition, as well as the risk of CVD. This recommendation is even more relevant for patients already suffering from CVD. The aim of this post-hoc analysis was to examine physicians’ attention to obesity as a risk factor, and to evaluate their recommendations for obese IHD patients at discharge from hospital.

Patients and Methods

The HOLEM project (HOLEM is the Hebrew acronym for “Instructions to a patient at discharge”) was designed to examine physicians’ adherence to NCEP prevention guidelines among patients with ischemic heart disease.
Patients
We included in the HOLEM project consecutive patients with acute and/or chronic ischemic heart disease who were admitted to internal medicine and cardiology wards between the years 1998 and 2000. Inclusion criteria were: a) acute myocardial infarction, b) unstable angina pectoris with significant electrocardiographic changes or documented coronary artery disease by angiography, c) stable angina pectoris with documented CAD by previous angiography or previous documented acute coronary syndrome, and d) admission to hospital because of a non-IHD-related condition and a documented history of IHD (either myocardial infarction, unstable angina pectoris, percutaneous coronary intervention or coronary artery bypass grafting). We excluded patients from the HOLEM study if they suffered from an illness that could influence the lipid profile, or damage their ability to achieve optimal secondary prevention. Excluded were the following: a) patients who suffered a cerebrovascular event, b) patients admitted because of an acute infection or had an infection during hospitalization, c) patients with an active malignant disease, and d) patients operated on in the 3 months preceding the study.

The facilities involved in the study comprised internal medicine departments and cardiac intensive care units of four large hospitals in different parts of Israel. Each department had sufficient tools to determine risk factor status for all patients (in this case, weight scales). Data were obtained by reviewing the discharge letters from the participating wards and at a follow-up visit in a specialized lipid clinic 6–8 weeks after discharge. A reviewing board examined the discharge letters for the inclusion and exclusion criteria. For the eligible patients, the reason for admission as well as data regarding the status of IHD, the diagnosis of hypertension, diabetes mellitus and hyperlipidemia, the notation of smoking and BMI status or “obesity” were obtained from the “chronic illnesses” or “risk factors” section of the letter. The board also reviewed the medications and any recommendations for lifestyle changes. The follow-up visit was designed to determine the proper treatment for secondary prevention for each patient. During that visit the diagnosis of IHD was verified, a lipid profile was examined, risk factor control status was examined, and the drug treatment was reviewed.

Methods and risk factor analysis
- Height and weight were measured at the follow-up visit, and BMI was calculated accordingly. Height was measured without shoes and weight was measured with the patients wearing underwear only.
- Diabetes was determined by examining the fasting glucose levels of patients at the follow-up visit. If fasting serum glucose was above 126 mg/dl or if patients were receiving anti-diabetes treatment, they were regarded as diabetic.
- Blood pressure was measured using sphygmomanometers in all hospitals. Patients were considered hypertensive if their blood pressure level was above 140/90 or if they were taking blood pressure-reducing medications.
- Serum cholesterol, triglycerides and high density lipoprotein-cholesterol levels were determined by using an automated enzymatic technique (Boehringer Mannheim, Germany). Patients were considered hyperlipidemic if their serum cholesterol was higher than 200 mg/dl and/or serum triglycerides higher than 200 mg/dl.
- Smoking status was recorded by questionnaire. For this sub-analysis we considered active smoking and patients who stopped smoking after the hospitalization as “smokers.”
- Physical exercise was not evaluated.

All patients signed an informed consent and the institution review board committee approved the study.

Statistical analysis
Data were analyzed using the SPSS statistical software for windows. We used chi-square to examine differences between non-parametric tests. Patients were categorized into groups according to their BMI: a) underweight for patients with BMI lower than 20 kg/m$^2$, b) recommended weight for BMI between 20 and 25 kg/m$^2$, c) overweight for BMI between 25 and 30 kg/m$^2$, d) obese for BMI higher than 30 kg/m$^2$, and e) morbidly obese for BMI higher than 40 kg/m$^2$.

To estimate the reporting accuracy of the different risk factors we compared the data obtained from the discharge letters and the diagnosis made at the follow-up visit. Accuracy was estimated by true positive and false positive results. True positive reporting was considered when the diagnosis of a certain risk factor was diagnosed and recorded in the discharge letters as well as at the follow-up visit. False positive reporting was considered if the risk factor was diagnosed and recorded in the discharge letter but the diagnosis was not made at the follow-up visit.

To discover the parameters that affected the BMI recording rate and the recording of recommendations to lose weight we used logistic regression. Age, gender, BMI, hospitalization ward (internal medicine vs. cardiology ward), reason for admission (cardiac vs. non-cardiac), and the number of additional risk factors were used as covariates. We used the term “cardiac admission” for patients who were admitted because of an acute myocardial infarction and/or unstable angina pectoris.

Results
Of 3649 patients enrolled in the HOLEM study, 2994 (2142 males, 71.5%) came to the follow-up visit and therefore were eligible to be included in this sub-analysis. Demographic data are presented in Table 1. Hypertension was the most common risk factor in our study group, followed by diabetes.

The mean BMI of the patients was 28.4 kg/m$^2$. Thirty-two percent of the patients were obese (BMI > 30 kg/m$^2$). Only 22.9% had optimal weight (BMI 20–25 kg/m$^2$). BMI was lower among patients over 70 years of age (27.9 ± 4.75 vs. 28.6 ± 4.51 kg/m$^2$ for patients under 70, $P = 0.006$). Obesity was much more prevalent among the females (48.7% as compared to 25.6% of the males, $P < 0.001$) [Table 1].

As expected, hypertension and diabetes were more prevalent

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CAD = coronary artery disease
Physicians Disregard Obesity

Among the obese patients, as compared to non-obese patients. We also found that the mean total cholesterol and triglyceride levels were higher among the obese group as compared to the non-obese groups; however, low and high density lipoprotein-cholesterol levels were not associated with weight status. The prevalence of the different risk factors is presented in Table 2, according to BMI group.

Among the 958 obese patients analyzed, obesity was recorded in 39.6% of the discharge letters. We found that the obesity recording rate and the weight loss recommendation rate were associated with BMI [Figure 1]. Among the obese patients 14.6% were advised to lose weight. We analyzed the reporting accuracy of the different risk factors and found that diabetes mellitus was the most accurately reported risk factor (85.5% true positive and 2.2% false positive) followed by hypertension (79.4% true positive and 11.2% false positive), hypercholesterolemia (73.2% true positive and 7.7% false positive), and smoking (65.8% true positive and 7.3% false positive). Reporting of obesity in the discharge letters was the least accurate, with only 39.6% true positive and 7.7% false positive.

Several factors were associated with BMI recording and with the rate of weight-loss recommendations given [Table 3]. In order to identify the parameters associated with BMI recording, we used logistic regression as noted. We found that BMI (odds ratio = 1.26, 95% confidence interval 1.15–1.38) and the number of risk factors (OR = 1.61, 95% CI 1.24–2.09) were associated with a higher rate of BMI recording and weight loss recommendations. Male gender (relative risk 0.58, 95% CI 0.36–0.99), age (RR 0.58, 95% CI 0.40–0.82), and admission department (cardiac* vs. non-cardiac) were significantly associated with BMI recording.

### Table 1. Demographic data of patients in the study

<table>
<thead>
<tr>
<th>All patients (n=2994)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male gender</td>
</tr>
<tr>
<td>Age (yrs)</td>
</tr>
</tbody>
</table>

### Table 2. Risk factors according to BMI group

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>&lt;25 kg/m²</th>
<th>25 kg/m²</th>
<th>≥ 30 kg/m²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>25.3%</td>
<td>32.1%</td>
<td>41.9%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hypertension</td>
<td>54.2%</td>
<td>63.6%</td>
<td>73.9%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>189 ± 39</td>
<td>190 ± 39</td>
<td>197 ± 44</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>152 ± 89</td>
<td>164 ± 109</td>
<td>184 ± 111</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LDL-cholesterol</td>
<td>117 ± 32</td>
<td>116 ± 32</td>
<td>118 ± 34</td>
<td>NS</td>
</tr>
<tr>
<td>HDL-cholesterol</td>
<td>42 ± 13</td>
<td>41 ± 12</td>
<td>42 ± 12</td>
<td>NS</td>
</tr>
</tbody>
</table>

Lipid levels are presented as mean ± SD. Diabetes and hypertension were analyzed by chi-square. Lipid levels were analyzed with ANOVA.

LDL = low density lipoprotein, HDL = high density lipoprotein, NS = not significant.

### Table 3. Parameters affecting the rate of obesity recording and weight loss recommendations

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BMI recording</th>
<th>Weight loss recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>32.5</td>
<td>11.7</td>
</tr>
<tr>
<td>Females</td>
<td>49.1</td>
<td>18.5</td>
</tr>
<tr>
<td>P</td>
<td>&lt; 0.0001</td>
<td>0.004</td>
</tr>
<tr>
<td>Admission departments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal medicine</td>
<td>34.9</td>
<td>7.6</td>
</tr>
<tr>
<td>Cardiology</td>
<td>14.3</td>
<td>2.6</td>
</tr>
<tr>
<td>P</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Admission Cardiac*</td>
<td>34.1</td>
<td>21.7</td>
</tr>
<tr>
<td>Non-cardiac</td>
<td>47.6</td>
<td>9.7</td>
</tr>
<tr>
<td>P</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Additional risk factors**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>14.1</td>
<td>3.3</td>
</tr>
<tr>
<td>1</td>
<td>36.2</td>
<td>12.4</td>
</tr>
<tr>
<td>2</td>
<td>45.5</td>
<td>18.2</td>
</tr>
<tr>
<td>3</td>
<td>57.5</td>
<td>23.0</td>
</tr>
<tr>
<td>4</td>
<td>50.0</td>
<td>–</td>
</tr>
<tr>
<td>P</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
</tbody>
</table>

* Cardiac admission: hospitalization due to either acute myocardial infarction or unstable angina pectoris.
** Risk factors: diabetes mellitus, hypertension, hyperlipidemia or smoking.

Age and BMI are presented as mean ± SD.
Despite the wide recognition that obesity is a difficult condition to treat and that most obese patients do not reduce their weight, some researchers reported an intriguing observation. Several studies showed that even a brief session in the primary care setting can motivate patients to lose weight, reduce their fat intake and increase their physical activity [20-22]. These observations should encourage physicians to change their attitude towards this modifiable risk factor. Physicians should also recommend physical exercise. The lack of physical activity is a known risk factor for CVD occurrence [23], and routine physical exercise not only improves cardiorespiratory fitness and reduces mortality [24], but also helps maintain optimal body weight after weight reduction [25].

The question whether hospital admission is the best time to encourage patients to change their lifestyle cannot be answered by us; however, we believe that giving obesity the same status as other risk factors is an important step towards improving the weight status of patients. More studies on the effect of sibutramine and orlistat on CVD morbidity and mortality are required.

It is clear that losing weight is not easy. Moreover, most obese people who do succeed in losing weight are unable to maintain it and regain the lost weight. Despite this, we believe weight reduction is essential in the management of CVD patients. Sibutramine and orlistat were proven effective for reducing weight and also had beneficial effects on the different risk factors. We contend that treating obesity is crucial; physicians should regard obesity as they do any other modifiable risk factor and should therefore recommend frequent usage of medication for this purpose.

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References


Capsule

Lidocaine spray does not reduce perineal pain

The local anesthetic lidocaine does not reduce perineal pain during spontaneous vaginal delivery. Sanders and colleagues randomized 185 women who had a spontaneous vaginal delivery without epidural analgesia to topically applied local lidocaine spray or placebo spray. They assessed self-reported pain during delivery on a scale of 0 to 100 (0 = no pain, 100 = worst possible pain) and found slightly worse results for the lidocaine group (77 vs. 72). They also found, however, that lidocaine may reduce genital trauma and was acceptable to both the women and midwives. Br Med J 2006;333:117

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Capsule

Missense mutations cause AF

Atrial fibrillation (AF) is a common and life-threatening condition in which erratic electrical activation of muscle cells in the upper chambers of the heart causes inefficient pumping of blood. As a result, blood pools in the heart and can form clots, which in turn increases the risk of stroke. Although AF typically arises in the context of other heart conditions, some patients present with AF on its own, and these individuals may provide valuable insights into the genetic determinants of the disorder. Studying heart tissue from 15 patients who developed idiopathic AF at an early age (their hearts were otherwise normal), Gollob et al. found that four patients carried missense mutations in the gene encoding connexin 40. Connexins are protein components of gap junctions, channels that conduct current between neighboring cells. Notably, in three patients, the mutations were not present in the germ line but instead were confined to heart tissue. Such tissue-restricted somatic mutations are a common cause of cancer, but this genetic mechanism is almost unprecedented in other human diseases. N Engl J Med 2006;354:2677

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