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

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Key words: ischemic heart disease, risk factors, obesity, physicians, quality assurance

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 2994 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/m^2 and 32% were obese (BMI ≥ 30 kg/m^2). Only 39.6% of the obese patients and 65.8% of the morbidly obese patients (BMI ≥ 40 kg/m^2) 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.

IMAJ 2006;8:553–557

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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 "Instuctions to a patient at discharge") was designed to examine physicians' adherence to NCEP prevention guidelines among patients with ischemic heart disease.

IHD = ischemic heart disease
BMI = body mass index
CVD = cardiovascular disease
NCEP = National Cholesterol Education Program

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 electrocardiographyic 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 was 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

CAD = coronary artery disease

Table 1. Demographic data of patients in the study

	All patients (n=2994)
Male gender	73.3%
Age (yrs)	63.0 ± 11.0
Risk factors	
Hypertension	64.5%
Diabetes	34.1%
Smoking	20.8%
Hyperlipidemia	32.0%
BMI (kg/m^2)	28.4 ± 4.6
Prevalence of obesity	
Males	25.6%
Females	48.7%
BMI distribution (kg/m2)	
< 20	1.2%
> 20 and < 25	22.9%
> 25 and < 30	43.9%
> 30 and > 40	30.7%
> 40	1.3%

Age and BMI are presented as mean ± SD.

Table 2. Risk factors according to BMI group

Risk factor	<25 kg/m^2	25 kg/m^2 < and > 30 kg/m^2	> 30 kg/m^2	*P*
Diabetes	25.3%	32.1%	41.9%	<0.001
Hypertension	54.2%	63.6%	73.9%	<0.001
Total cholesterol (mg/dl)	189 ± 39	190 ± 39	197 ± 44	<0.001
Triglycerides (mg/dl)	152 ± 89	164 ± 109	184 ± 111	<0.001
LDL-cholesterol (mg/dl)	117 ± 32	116 ± 32	118 ± 34	NS
HDL-cholesterol (mg/dl)	42 ± 13	41 ± 12	42 ± 12	NS

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.

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

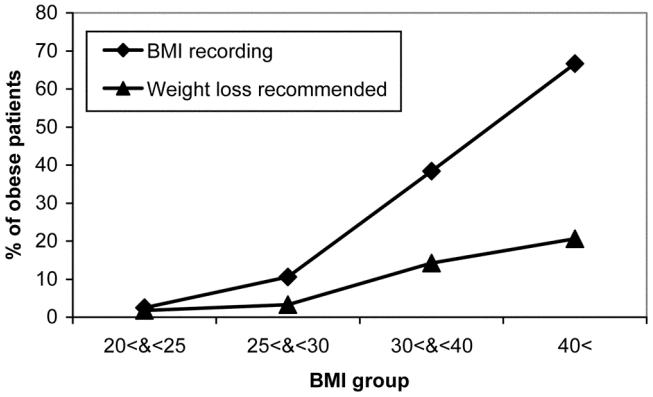

Figure 1. Obesity recording and weight-loss recommendations in the discharge letters according to weight groups.

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

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

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

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,

OR = odds ratio
CI = confidence interval
RR = relative risk

95% CI 0.36–0.99) and admission to the cardiology departments (compared to internal medicine departments) (OR = 0.39, 95% CI 0.18–0.32) were associated with a lower rate of BMI recording. Cardiac admissions (i.e., acute myocardial infarction and unstable angina pectoris) did not influence the recording rate.

Discussion

We found that the different CVD risk factors receive different degrees of attention, and obesity was the risk factor that physicians pay the least attention to. We documented that fewer than 40% of the obese patients suffering from IHD had obesity recorded at discharge, and weight loss was recommended to only 15% of the patients. Even more troubling is the fact that physicians knew the weighing was done properly but many disregarded the results. It is possible that our assessment of obesity recording is not accurate, since the patients may have lost (or gained) weight during the 6–8 weeks between discharge and the follow-up visit. However, it is feasible to assume that the changes in body weight during this relatively short period would not significantly change our results.

Several studies have shown that physicians do not pay attention to obesity and do not give adequate recommendations for patients to lose weight. In 1999, Galuska et al. [12] showed that among the obese patients who visited their family physician for problems not related to obesity, less than half received any recommendations to lose weight. Stafford and co-workers [13] investigated the number of physicians who advised weight loss and found that only 50% of obese patients who visited their family practitioner because of obesity-related conditions were advised to lose weight.

We believe these results to be indicative of physicians' attitude towards obesity as a modifiable risk factor, despite the fact that we merely audited the discharge letters. In general, patients at risk do not remember ever having received information about management of their risk factors [14]. The low accuracy of obesity recording that we found as compared to the accuracy of hypertension and diabetes mellitus recordings is indicative of the inadequate attention physicians pay to this risk factor, despite the proven relation to morbidity and mortality, and despite the medications available to help treat this risk factor. Although there are no data to support that weight reduction medications reduce CVD morbidity and mortality, orlistat has proven beneficial effects on multiple risk factors for CVD (such as diabetes, insulin levels, cholesterol and hypertension) [15] and reduces the risk for CVD as a consequence [16]. Data on sibutramine are scant, although it has been demonstrated to help control other risk factors as well [17]. Another drug that is in the advanced research phase is rimonabant (Acomplia™, Aventis Sanofi). This drug was shown to induce weight loss with a potency similar to other drugs [18]; however, one of its major side effects is depression and the U.S. Food and Drug Administration has yet to give its approval [19].

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 fittness 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.

Acknowledgments. This study was supported by a research grant from Merck Sharp & Dohme (Israel 1996) Ltd.

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