Evidence for age-based rationing in a Swiss University Hospital[1]

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Summary

Aim: To test the hypothesis that rationing of medical management mainly based on age exists in our health care system today.

Methods: We studied 303 consecutive patients hospitalised for acute coronary syndrome (ACS) and 163 consecutive patients hospitalised with congestive heart failure (CHF). They were divided into two age groups; patients aged less than 75 years and those equal to or older than 75 years.

Results: Our main findings were a significant underuse of stress tests (p <0.001) and coronary angiography (p <0.0001) in elderly patients with ACS and a significant underuse of echocardiography (p <0.0001) in patients with CHF of the same age group. In patients with ACS, there was also a trend towards underuse of statins in elderly patients with hypercholesterolaemia. In addition, we noted that the use of beta-blockers in ACS and of ACE inhibitors in CHF was better than in previous published studies but that many patients were still not treated according to evidence based medicine.

Conclusion: The lower rates of diagnostic tests performed and the lower statin use observed in elderly patients suggest "hidden" rationing of health care in elderly patients.

Key words: age-based rationing; coronary heart disease; congestive heart failure; elderly patients; statin; coronary angiography

Introduction

Costs of health care are increasing in Switzerland as in most countries inducing open political and public discussions on cost savings either by rationalising diagnostic and therapeutic procedures for inpatients and outpatients or by rationing medical care. Arguments for hidden rationing in certain patient groups such as the elderly have been raised in the political arena. Therefore, we attempted to test the hypothesis that a "de facto" rationing of medical care for patients aged 75 years or older already exists today without written consent.

To address this question we chose patients with an acute coronary syndrome (ACS) or with congestive heart failure (CHF), i.e. patients with two syndromes that are particularly common in the elderly population and for which evidence based management guidelines are well established. For both syndromes data are available mainly from the US indicating a lower resource utilisation in elderly patients [1–10, 17].

Methods

We conducted a retrospective observational study. Medical charts of all patients in the University Hospital of Basel, Switzerland, with the diagnosis of an ACS (unstable angina, Non-Q-Wave- and Q-Wave-myocardial infarction) or of CHF in 1998 were collected and analysed. We identified these patients by searching the electronically stored statistics of the diagnoses of hospital inpatients (ICD-9-Code). Therefore all patients with clear clinical diagnoses have been included in the analysis. Physicians in charge of the treatment of these patients were general internists, working either in the coronary care unit or in the normal wards. Cardiologists were only consulted in cases where the strategy of diagnosis and treatment was not clear to the primary physician. Patients' data at hospital entry included age, gender, history of coronary artery disease (CAD), hypertension or CHF, cholesterol status, comorbidity (such as COPD, peripheral vascular disease, renal or liver insufficiency, carcinomas, etc.). Life limiting

diseases in the comorbidity category were defined as those where life expectancy was less than one year. Hypercholesterolaemia was defined as the presence of 2 of the following laboratory findings: total cholesterol >5.2 mmol/l, low density lipoprotein cholesterol >3.0 mmol/l, quotient total cholesterol to high density lipoprotein cholesterol >5. This was also the definition used by the hospital at that time.

All charts were reviewed for the use of stress tests (exercise ECG, dobutamine stress echocardiography (DSE) or exercise/stress myocardial perfusion scintigraphy (MPS) coronary angiography, revascularisation by percutaneous coronary intervention (PCI) or coronary artery bypass graft (CABG) surgery, medical therapy with beta-blockers, statins and the mention of cardiovascular risk factors in the discharge letter of patients with ACS and the use of echocardiography, ACE-inhibitor treatment and whether ejection fraction and body weight at discharge were mentioned in the discharge letter for patients with CHF.

The results were compared between two patient groups divided at age 75, either younger than 75 years or 75 or older.

Statistics

Data are presented as mean values or percentages. Differences in mean values were compared using Students T-test and in proportions by the Chi square test. The p-value was assumed to be significant at a level of 0.05. In order to correct for comorbidity, patients with such diagnoses were excluded from secondary analyses, particularly those with ACS, where there was a significant difference in comorbidity between age groups.

Results

ACS-Group

A consecutive series of 303 patients admitted with an ACS was identified. Of these patients, 107 (35%) were aged ≥75 years and 196 (65%) were <75 years. There was no significant difference in the rate of patients with acute ST elevation myocardial infarction versus patients with ACS without ST elevation. There were, however, significantly more women in the group of the elderly patients. Regarding coronary angiography, we found that in both age groups men tended to have more examinations (p = 0.36). There were also more patients with comorbid conditions in the group of elderly patients, but with regard to life limiting disease, the difference was no longer significant (table 1). Inversely, there were significantly more patients with hypercholesterolaemia in the younger population.

During hospitalisation, coronary angiography was performed in 22% of patients aged 75 years or older versus 83% of patients below 75 years (p <0.0001). An analysis of the group of patients aged below 60 years showed an even higher rate of coronary angiography at 91%. Fifty-four percent of elderly patients with coronary angiography had either PCI (42%) or CABG surgery (12%). In the group aged below 75 years, the numbers were 85% for revascularisation procedures, 66% for PCI and 19% for CABG. A significant difference (p <0.001) was also observed for stress tests including stress imaging methods in favour of younger versus older patients. Analysing only the population with no comorbidity the statistical difference remained significant for coronary angiography (p <0.001) and stress imaging (p <0.05) (table 3). With regard to medical therapy, the prescription of beta blocking agents was similar in both patient groups (57% in patients aged ≥75 years vs. 65% in patients aged <75 years [p = 0.18]) but prescription of statins for patients with hypercholesterolaemia was noted less frequently in elderly patients (51% in elderly patients vs. 85% in younger patients [p = 0.058]). Antiplatelet agents were given to all patients but risk factors were mentioned significantly less frequently in the discharge letter of the elder patient group (table 2). The median length of hospitalisation was significantly shorter in younger patients.

CHF-Group

A total of 163 consecutive patients admitted with the primary diagnosis of CHF were included in the analysis, 58% of whom were ≥75 years and 42% <75 years old. In the group of elderly patients,

Table 1

Patient characteristics in the ACS group.

	age ≥75 years	age <75 years	p-value
Number of patients	107	196	–
Women	36%	19%	p <0.001
ST elevation infarction	59%	64%	p = 0.40
Comorbidity	37%	21%	p <0.01
Life limiting disease	12%	7%	p = 0.14
High cholesterol	51%	77%	p <0.0001

Table 2

Results in the ACS group.

	age ≥75 years	age <75 years	p-value
Coronary angiography	22%	83%	p <0.0001
Stress imaging	31%	52%	p <0.001
Beta-blocker	57%	65%	p = 0.18
Statins in hypercholesterolaemia	51%	85%	p = 0.058
CAD risk factors in discharge letter	73%	89%	p <0.001
Median hospitalisation	13.4 days	10.9 days	p <0.04

Table 3

Results of patients without comorbidity in the ACS group.

	age ≥75 years	age <75 years	p-value
Patients without comorbidity	67	155	–
Coronary angiography	28%	81%	p <0.001
Stress imaging	25%	46%	p <0.05

Table 4

Patient characteristics in the CHF group.

	age ≥75 years	age <75 years	p-value
Number of patients	94	69	–
Women	62%	32%	p <0.001
Comorbidity	56%	57%	p = 0.97

Table 5

Results in the CHF group.

	age ≥75 years	age <75 years	p-value
Number of patients	94	69	–
Echocardiography	39%	70%	p <0.0001
LVEF in discharge letter	40%	70%	p <0.0001
ACE-inhibitor	65%	75%	p = 0.15
Weight in discharge letter	44%	55%	p = 0.15
Median hospitalisation	13.84 d	12.29 d	p = 0.22

LVEF = left ventricular ejection fraction

there was twice the number of females than in the younger age group. No difference could be found in the presence of comorbid conditions, obviously a frequent finding (56%) in patients with CHF (table 4). A diagnostic echocardiography was performed less frequently in elderly patients as shown in table 5. Overall there were slightly more echocardiographies in men than in women (p = 0.44), but this remained similar for both age groups. The medication with an ACE-inhibitor was not significantly different in both groups; the use of diuretics was similar. A significant difference could be found in the documentation of left ventricular ejection fraction (LVEF) in the discharge letter, but this was dependent on the measurement by echocardiography and not a parameter by itself. The body weight was mentioned only in every second discharge letter. The median length of hospitalisation showed no significant differences between both age groups.

Discussion

The present analysis of patients with ACS and CHF admitted to a large University Hospital in Switzerland showed that patients <75 vs. ≥75 years of age differ not only in their age, but also in gender and comorbidity. In patients over 75 years of age with ACS the rate of women was roughly double and comorbidity was markedly elevated. However, this does not seem to explain the significantly lower use of diagnostic procedures observed in elderly ACS patients. Prognostically relevant medical therapy was used at a similar rate in both age groups, except for statin therapy in patients with hypercholesterolaemia that was given less frequently to elderly patients. There was a significant difference in revascularisation rate in relation to age: fewer elderly patients benefited from this treatment option. Previous reports from the US have drawn attention to a certain "underuse" of diagnostic procedures in elderly patients, particularly after myocardial infarction. [1–3, 11]. The large GUSTO-I study showed large inter-country differences in angiography rates [1] and demonstrated that age and presence of an angiographic facility were more important predictors of a patient having coronary angiography than recurrent ischaemia. [1] The present results are in accordance with these previous findings showing that not only angiography but also non-invasive stress tests are used less frequently in elderly patients despite the fact that coronary artery disease is generally more extensive in these patients. Regarding the use of beta-blocker therapy there was no significant difference with regard to age ≥75 vs. <75 years in the present study, although the rate tended to be lower in the higher age group. Still, the beta-blocker rate of 57% observed in patients ≥75 years was markedly higher than that reported by

Krumholz et al. of 49% for patients older than 64 years [2]. In contrast to these encouraging findings regarding the use of beta blockers in elderly patients, there was a trend towards a lower rate of statin therapy in elderly patients with hypercholesterolaemia in the present study. There are little data regarding statin use and age outside the large prospective lipid lowering trials. In the Scandinavian Simvastatin Survival Study [12] and in the CARE-Trial [13] large benefits of statin therapy were described for elderly patients (>65 years) with prevention of 225 hospitalisations/1000 elderly patients treated vs.only 121 hospitalisations/1000 younger patients treated [13].

There is no indication that elderly patients should draw less benefit from an exact objective diagnosis of their disease in ACS and there is clear evidence that they benefit at least as much from secondary preventive therapy with beta-blockers and statins (in hypercholesterolaemia). In a subgroup analysis of the Norwegian Timolol study [14, 15] patients aged between 65 and 75 years showed an even greater benefit from Timolol regarding prevention of cardiac death and reinfarction compared with younger patients. There were no hints in either the Lipid-Trials (CARE and 4S) or in the Norwegian Timolol Study that this benefit would be smaller in patients aged above 75 years [12–15]. The higher rate of comorbid conditions may play a role in ordering tests and prescribing medication, but even after excluding patients with relevant comorbidities, important differences remained. A possible reason for these differences could have been the reluctance of elderly patients to undergo noninvasive or invasive testing and their reluctance to take medicaments. Unfortunately, we could find no remarks about

discussions of these topics with the patients in their charts. Therefore, the lower rates of diagnostic tests performed and the lower statin use may be interpreted as hidden rationing of health care in these patients. Whereas the potentially increased risk of revascularisation procedures may be used as an argument against their use in some elderly patients, this risk may generally only be determined after non-invasive testing and/or angiography and should therefore rarely be a valid reason not to perform diagnostic testing. The "hidden rationing" hypothesis may also explain the somewhat lower rates of beta-blocker use although more frequent drug interaction and intolerance in elderly patients may also play a role here. This is less apparent for the somewhat lower statin use in elderly patients; here, the longer-term benefit and the relatively high cost of the drugs may be arguments against their use, but these should not be first-line reasons to withhold potent drugs in hospitalised patients. Another explanation, at least for the lower use of statins, might be that some of the treating physicians may not have been familiar with the latest study results.

In CHF patients the rate of women reached 61% in the elderly patient group, whereas there was no difference in comorbidity between age groups. Overall every second patient suffered from a relevant comorbid condition, mostly from renal insufficiency. We focused on the exact diagnosis of heart failure by echocardiography because a large percentage of heart failure cases in elderly patients are due to diastolic rather than systolic dysfunction. Therefore, the results of the echocardiography may lead to a change in treatment strategy. Again, our results showed a significant underuse of this non-invasive test in elderly patients, although it has been shown to provide important information on prognosis and optimal therapy in patients with CHF. Based on their charts, LV function was known in only a small minority of patients with CHF, who did not have an echocardiography during hospitalisation. This observation is supported by similar rates of echocardiographies performed and documentation of LVEF in the discharge letter. The observed rate of 39% of echocardiographic documentation of left ventricular ejection fraction was slightly higher than that reported by Fishkind et al. of 28% [5] but lower than that reported by Ghali et al. (52%) [9].

There was no significant difference in ACE inhibitor usage with regard to age ≥75 vs.<75 years, although the rate tended to be lower in the higher age group. The rate of ACE inhibition of 65% observed in patients ≥75 years was higher than previous findings in elderly patients that ranged between 38%, [5] 52%, [9, 17] 54%, [8] and 58% [6]. As discussed for ACS patients, the reason for the lower use of echocardiography could have been the reluctance of elderly patients to undergo this non-invasive examination. This seems unlikely however, because echocardiographies are done based on the decision of the treating physician and patients do not decide whether or not to perform this test nor do they have to give formal informed consent. Comorbidity could not explain age-related differences in echocardiography use because the rate of comorbid conditions was similar in both age groups. The somewhat lower rate of ACE inhibitor use in the elderly group, however, may be due to more frequent drug interaction and intolerance in elderly patients, although this was not documented in their charts. A previous study of the prescription of ACE inhibitor in Swiss primary care by Muntwyler and Follath also showed an age related difference, which was independent of comorbid conditions and contraindications [17], strongly supporting our findings.

A big problem in finding reasons for not using diagnostic and therapeutic tools was the lack of specific remarks in patients' charts regarding decision making and patient information. We therefore assumed that the reason for this decision must have been an obvious one and, in retrospect, the most obvious one was the patients' age. In the future, hospital charts should clearly document deviations from agreed protocols of investigation or treatment and the argument "too old" should no longer be acceptable. We have to admit, however, that in published randomised trials on ACS and CHF, patients above age 75 years are severely underrepresented [16] and therefore the evidence as to how to manage them is largely missing. However, in subgroup analysis, treatment benefits are usually greater in elderly patients due to their higher baseline risk. Therefore, even without clear evidence of how to manage elderly patients, there is no justification based on these analyses to withhold diagnostic tools or treatments for which there is definite data in younger patient populations. Obviously more studies in elderly patients are urgently needed. These studies should not primarily be focussed on preventing death but rather preventing disability, improving quality of life and keeping patients out of hospitals. Society will have to realise that optimal care of our elderly patients according to medical standards will not be free of charge and that the decision about how far we can go in treating our elderly patients will also be an ethical one. Therefore, this decision should not be made "secretly" by doctors but rather by the people themselves or by knowledgeable politicians representing them.

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