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Elderly with Multi-morbidity and Acute Coronary Syndrome: Doctors' Views on Decision-Making

Running title: Doctors' Decision-Making for Elderly with Multi-morbidity

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Abstract

Background: In most Western countries the growing gap between available resources and greater potential for medical treatment has brought evidence-based guidelines into focus.

However, problems exist in areas where the evidence base is weak, e.g. elderly patients with heart disease and multiple co-morbidities.

Objective: Our aim is to evaluate the views of Swedish cardiologists on decision-making for elderly with multiple co-morbidities and acute coronary syndrome without ST-elevation (NSTEMI ACS), and to generate some hypotheses for testing.

Methods: A confidential questionnaire study was conducted to assess the views of cardiologists/internists (N=370). The response rate was 69%. Responses were analyzed with frequencies and descriptive statistics. When appropriate, differences in proportions were assessed by chi-square test. A content analysis was used to process the answers to the open-ended questions.

Results: 81% of the respondents reported extensive use of national guidelines for care of heart disease in their clinical decision-making. However, when making decisions for multiple-diseased elderly patients, the individual physician's own clinical experience and the patient's views on treatment choice were used to an evidently greater extent than national guidelines. Approximately 50% estimated that they treated multiple-diseased elderly patients with NSTEMI ACS every day. Preferred measures for improving decision-making were: a) carrying out treatment studies including elderly patients with multiple co-morbidities, and b) preparing specific national guidelines for multiple-diseased elderly patients.

Conclusion: In the future, national guidelines for heart disease should be adapted in order to be applicable for elderly patients with multiple co-morbidities.

Key words: elderly, acute coronary syndrome, co-morbidity, guidelines, decision-making

Main text

Background

Evidence-based guidelines are intended to support clinicians in clinical decision-making (1,2). By increasing compliance to evidence-based guidelines, among health care providers, the aim is to optimize benefits to patients with specific diseases, and the benefits have been well documented (3,4). Crucial parts of guidelines are randomized controlled trials (RCTs) and systematic reviews, which provide the most reliable data (5).

However, RCTs and systematic reviews primarily focus on internal validity (6,7), while their external validity and generalizability, i.e. whether the results can be applied to patients in a clinical setting in routine practice, have been questioned (5,8). Many RCTs exclude elderly patients with multiple co-morbid conditions (1). Extrapolating from studies on younger populations without significant multimorbidity is problematic. In fact, it has been suggested that adhering to guidelines in caring for elderly patients with several co-morbid conditions may have undesirable effects (9).

The Swedish National Board of Health and Welfare has been commissioned since 2000 to draw up evidence-based guidelines to support priority setting in health care. The guidelines are expected to influence health care policy-making as well as clinical decision-making. The first guidelines for the care of heart disease were published in 2004 and a second edition of these guidelines was published in 2008 (10).

In attempts to establish useable priority setting in a Scandinavian context difficulties have been pointed out (11): when there is a lack of evidence, when patient groups are not satisfactorily defined, and when there is uncertainty about how different ethical values should be weighed, especially concerning the aims of health care. Elderly patients with multiple diseases represent all of these issues (12-15). Further, a clear tendency towards inpatient care concentrating on acute incidents has been described (16), as well as the need for an integrated

care management model for the care of elderly and chronically ill patients, which was recently pointed out in this journal (17).

The demographic prognosis for the Swedish population stresses the volume of the problem, not least in the context of priority setting. Today 460,000 people (5 per cent of the population) are 80 years of age or older. In 25 years this number is estimated to be 760,000 (18). The percentage of elderly people in our hospitals will continue to grow, and many of them will have multiple diseases and large needs (19). The most common diagnostic category for this patient group in Sweden and in other Western countries is cardiovascular disease (20, 21). Regarding patients with acute myocardial infarction, studies have shown the prognostic importance of acute and chronic co-morbid conditions (22, 23). However, despite the number of elderly patients with heart disease and multiple co-morbidities, nothing is known about the cardiologist rationale when making clinical decisions for patients representing this growing population.

Our aim in this paper is to evaluate the views of Swedish cardiologists on decision-making for elderly with multiple co-morbidities and acute coronary syndrome without ST-elevation (NSTEMI ACS). We want to get a picture of doctors' perceptions of potential pitfalls and possible improvements and, finally, to generate some hypotheses for testing in future studies.

Methods

A confidential survey study was conducted to assess the views of cardiologists on clinical decision-making for elderly with NSTEMI ACS and multi-morbidity. From a list of 641 cardiologists (obtained from the Swedish National Board of Health and Welfare and the Swedish Health Care Address Register), all presumed to have dealt with multiple-diseased elderly patients with NSTEMI ACS during the past year, 400 were randomly selected to receive a questionnaire (described below) via postal letter. Three distributions, approximately two

months apart, took place between September 2007 and January 2008. The questionnaires were sent with a cover letter describing the study. A non-responder analysis was conducted via telephone.

The questionnaire was based on a literature search, a register study on multiple-diseased elderly patients, and discussions with a panel of cardiologists with experience in drawing up national guidelines. The first part contained questions about the physicians' demographic and work-related characteristics. The second part consisted of nine questions concerning respondent views on evidence-based guidelines, aspects of care and priority setting for multiple-diseased elderly with NSTEMI ACS, and areas of possible improvement. Multiple-diseased elderly were defined as follows: "Individuals 75 years of age or older, who have received inpatient hospital care three or more times during the past 12 months and who have three or more diagnoses in three or more diagnostic groups according to the ICD-10 classification system" (24). There was space for free comments throughout the questionnaire. One hundred of the physicians received a long version of the questionnaire with three additional open-ended questions, focusing on areas of possible improvement.

Analysis

The quantitative part of the data was analyzed using SPSS for WINDOWS version 15. Responses were analyzed with frequencies and descriptive statistics. When appropriate, differences in proportions were assessed by chi²-tests. A content analysis (25) was used to process the free comments and the answers to the open-ended questions.

Results

Of the initial random sample of 400 cardiologists, 30 had not dealt with this patient group the last 12 months. From the remaining 370 subjects we received 255 completed questionnaires (a

total response rate of 69%), 64 of the long versions (a 70% rate), and 191 the shorter versions (a 68% rate). The responders answered 95 to 100% of the first nine items. For the open-ended questions the response rate varied from 46 to 54%. Further, there were 89 free comments. It should be stressed that of the responding cardiologists 91% were also a specialist in general internal medicine.

Table I shows the demographic and work-related characteristics of responders and, when possible, those of all physicians initially included. For the non-responder analysis we reached 21 non-responding physicians (of 25 randomly chosen physicians) via telephone; no one objected to the contact. The analysis did not indicate any evidently different views among the non-responders.

90% of the cardiologists considered themselves well familiar with the contents of *National guidelines for care of heart disease*. Mainly positive attitudes to the use of national guidelines in clinical decision-making were reported by 94%. Responders' answers regarding reported clinical use of national guidelines for care of heart disease are shown in Table II. Answers to the item concerning present responder use of guidelines were dichotomized into a 'positive group' (answers 'very frequent' or 'rather frequent') and a 'negative group' (answers very infrequent or rather infrequent), and these were cross-tabulated with responder characteristics. By doing so we found a significant difference regarding type of hospital ($\chi^2=14,8$, $df=2$, $p<0,001$); Bonferroni's posthoc-test showed that responders from small (local) ($p=0,002$) and mid-sized (county) ($p=0,007$) hospitals assessed the usefulness of national guidelines in clinical decision-making as significantly greater than did responders from university (regional) hospitals. Similarly, previous participants in policy-making, e.g. working out guidelines, at any level of organization, showed a more positive attitude ($n=64$, $\chi^2=4,6$, $df=1$, $p=0,039$) than non-participants ($n=190$). No significant differences were observed concerning sex or number of years as a cardiologist. Among those who made

Table I
Characteristics of responders and all physicians initially included % (n)

Characteristics	Responders (n=255)	All physicians initially included (n=400)
Sex, male	76 (194)	79 (316)
Type of hospital		
Small (local)	19 (48)	19 (77)
Mid-sized (county)	38 (96)	36 (143)
Large/academic (regional)	43 (110)	44 (175)
Other	0,4 (1)	1 (5)
Clinic		
Cardiology	55 (141)	49 (197)
Internal medicine	42 (107)	47 (189)
Other	3 (7)	4 (14)
Number of years as a cardiologist		n/i
0-5	12 (30)	
6-10	28 (72)	
11-20	37 (95)	
>20	23 (58)	
Also a specialist in internal medicine, yes	91 (232)	n/i
Percutaneous coronary intervention at your hospital, yes	77 (196)	n/i
Previous participation in priority setting at the policy-making level (local, regional or national), yes	25 (64)	n/i
n/i, No information		

comments, several focused on limitations in the applicability of guidelines in a clinical context. Some of them emphasized that guidelines become out-of-date relatively quickly.

The mean of the responders' estimates of the proportion of patients with NSTEMI ACS who are multiple-diseased elderly, according to the stipulated definition, was 37% (SD=18%, median=30%, 25th percentile=25%, 75th percentile=50%). The median estimates of the proportions of these patients in different care units were as follows: cardiac intensive care 40%, other cardiac care 25%, internal medicine care 25% and other care unit 10%. When the estimated proportions of multiple-diseased elderly with NSTEMI ACS cared for in cardiac intensive care units were cross-tabulated with type of hospital we found a significant

difference ($\chi^2=71$, $p=0,003$); the proportion was significantly higher in small hospitals than in mid-sized hospitals (Bonferroni: $p=0,044$) and university hospitals (Bonferroni: $p<0,001$).

Table II. Typical comments emphasized the uncertainty in the estimation, but also that this population of patients is large and growing, and that it is difficult to choose the appropriate care level for them.

Views on clinical decision-making for multiple-diseased elderly with NSTEMI ACS are summarized in Table III. No evident differences regarding views on using national guidelines for these patients were found concerning the following responder characteristics: type of clinic or hospital, also a specialist in internal medicine, sex, number of years as a cardiologist or previous participation in policy-making. Nor did views on decision-making based on one's own clinical experience or relatives' views differ. When different responder characteristics were cross-tabulated with suggested ways of improving decision-making, no significant differences were detected, with one exception; those responders who had participated in policy-making were significantly more positive toward carrying out treatment studies including multiple-diseased elderly ($\chi^2=9,4$, $p=0,025$) than those who had not done so.

Regarding cardiologist views on how multiple-diseased elderly patients with NSTEMI ACS are prioritized for coronary angiography compared to other patients, see Table II. A typical comment from a responder answering 'justifiably high' was:

'The decisions become more complex due to age and co-morbidity, but neither age nor co-morbidity is a crucial argument. For example, PCI (Percutaneous Coronary Intervention) can also be an excellent symptomatic treatment for multiple-diseased elderly.'

(47-year-old male at a university hospital)

Table II. Cardiologists reporting participation in policy-making, general use of national guidelines, estimations regarding elderly multiple-diseased NSTEMI ACS patients and views on how these patients are prioritized; small (local) hospitals usually serving 50-100,000 inhabitants, mid-sized (county) hospitals serving 100,000-300,000 inhabitants and university (regional) hospitals serving more than 300,000 inhabitants.

%(n)	Total	Small hospital	Mid-sized hospital	University hospital
Participation in policy-making at any level	25 (64)	25 (12)	29 (28)	22 (24)
Proportion reporting rather frequent or very frequent clinical use of national guidelines	81 (205)	94 (44)	87(83)	71 (78)
Reported proportion of elderly multiple-diseased NSTEMI ACS patients (%)	37	41	35	36
Estimated proportion of elderly multiple-diseased NSTEMI ACS patients being treated in intensive care unit (%)	44	56	44	37
Proportion reporting treatment of elderly multiple-diseased NSTEMI ACS patients				
- every day	47 (121)	56 (27)	56 (54)	36 (40)
- >once a week	35 (89)	38 (18)	38 (36)	32 (35)
- >once a month	13 (33)	4 (2)	6 (6)	22 (24)
- less often	5 (12)	2 (1)	0 (0)	10 (11)
Views on how these patients are prioritized regarding coronary angiography				
- too high	17 (41)	15 (7)	19 (18)	15 (16)
- justifiably high	48 (118)	40 (19)	45 (43)	53 (55)
- justifiably low	31 (76)	36 (17)	34 (32)	26 (27)
- too low	5 (12)	9 (4)	2 (2)	6 (6)

Table III. Clinical decision-making for multiple-diseased elderly with NSTEMI ACS. % (n)

Questions	Very small	Rather small	Rather large	Very large
To what extent do you use the following sources when making clinical decisions for multiple-diseased elderly with NSTEMI ACS?				
National guidelines for heart care	4 (11)	28 (71)	60 (152)	8 (20)
Your own clinical experience		3 (7)	55 (141)	42 (106)
Patient views		5 (12)	57 (146)	38 (96)
Relative views	6 (15)	44 (111)	44 (111)	6 (16)
To what extent do you think that the following measures would improve clinical decision-making for multiple-diseased elderly with NSTEMI ACS?				
Improved adherence to <i>National guidelines for heart care</i>	6 (15)	44 (109)	43 (105)	7 (16)
Specific evidence-based national guidelines for multiple-diseased elderly	1 (3)	10 (25)	48 (121)	40 (101)
Local guidelines for care for multiple-diseased elderly	4 (10)	21 (53)	57 (142)	18 (45)
More treatment studies including multiple-diseased elderly	1 (3)	8 (20)	39 (97)	52 (130)

Responders answering ‘too high’ did not differ from the others regarding demographic and work-related characteristics. However, these responders were more willing to give free comments; typical responses were as follows:

‘We do somewhat more than is reasonable with these patients. A cardiologist may tend to focus on the coronary vessels, overestimating the coronary disease and

underestimating cognitive functions and co-morbidity, which can limit length of life and quality of life to a greater extent.’

(53-year-old male at a small hospital)

“You do not dare risk being blamed for ‘doing too little’.”

(54-year-old female at a mid-sized hospital)

There were three open-ended questions. Since the answers to the first two questions were similar regarding contents, we categorized them into three main groups, constituting a basis for our content analysis, see Table IV. The third open-ended question was: Are there any obstacles to your suggested strategy, and, if so, what are they? Many responders stressed the lack of evidence and applicable guidelines for these patients. Other identified obstacles were lack of time in the clinic, lack of knowledge concerning geriatrics, and malfunctioning logistics, i.e. communication problems within the health care system. Several responders emphasized that the ethical basis for treatment of multiple-diseased elderly is uncertain, with unclear treatment goals; they claimed that attitudes and prejudices among cardiologists regarding the preferences of these patients tend to aggravate the problem. Opinions differed widely as to whether cardiologist attitudes in general contribute to under-use of medical interventions or to over-treatment.

Discussion

In spite of the fact that 81% of the respondents reported extensive use of national guidelines for care of heart disease, several comments and answers to open-ended questions focused on limitations in the applicability of guidelines in a clinical context. Of the respondents, 47% reported that they treated multiple-diseased elderly NSTEMI ACS patients every day, and 35%

Table IV. Content analysis of the first two open-ended questions in the questionnaire, consisting of one theme and three categories, i.e. the main proposals from the responders, each proposal consisting of three sub-categories, and two representative quotations.

<p><i>Theme: enhancing clinical prioritization</i> What would be the most important measure in order to enhance clinical priority setting (decision-making) for elderly multiple-diseased NSTEMI ACS patients? How could clinical decision-making regarding elderly multiple-diseased NSTEMI ACS patients be enhanced, when choosing between life prolonging treatment and good nursing and alleviation of symptoms?</p>		
<p><i>Category: treatment studies</i> Carrying out prospective treatment studies including multiple-diseased elderly patients.</p>	<p><i>Category: specific guidelines</i> Working out specific guidelines for multiple-diseased elderly patients.</p>	<p><i>Category: communication</i> Enhancing communication related to decision-making in multiple-diseased elderly patients</p>
<p>-Few exclusion criteria -Evaluating the role of comorbidity, cognitive impairment and frailty in the benefit-risk ratio -End-points focusing on quality of life</p>	<p>-Considering the total risk, not only the cardiovascular risk -Assessing the biological age/frailty of patient groups -Considering the most relevant comorbidities</p>	<p>-Communicating risk-benefit ratios properly to patients and relatives -Determining patients' attitudes and preferences -Better communication between cardiologists, internists and general practitioners</p>
<p>'Treatment studies including multiple-diseased elderly are needed. Most studies on ACS preferably include mainly patients approximately 60-65 years old.' (47-year-old male at a university hospital)</p> <p>'Solid studies, with few exclusion criteria, including multiple-diseased patients over 75 years of age' (47-year-old female at a small hospital)</p>	<p>'Distinct guidelines are needed for patients with NSTEMI ACS and some of the following (co-morbidities): advanced renal insufficiency, advanced liver insufficiency, advanced malignant disease, gastrointestinal bleeding, age over 90 years, and ongoing treatment with warfarin.' (42-year-old male at a university hospital)</p> <p>'The problem complex should be considered in national guidelines.' (48-year-old male at a mid-sized hospital)</p>	<p>'Honesty in the communication with patients. Information about procedure-related risks should be given properly – no false expectations.' (43-year-old female at a university hospital)</p> <p>'Computerized medical records are necessary, with doctor access to records of other clinics and primary care.' (56-year-old male at a university hospital)</p>

once or a few times a week. The most frequently used sources in clinical decision-making for these patients were the individual cardiologist's own clinical experience and patient views.

Regarding ways of improving the decision-making, two suggestions dominated: prospective treatment studies with few exclusion criteria, and/or to work out specific guidelines for multiple-diseased elderly, despite the weak evidence base. It would then be particularly

important to assess patients' biological age, cognitive status and co-morbidities, thus considering the total risk and not only the cardiovascular risk.

The questionnaire was based on three main sources, a literature search, discussions with a panel of cardiologists, and a register study, thus enabling the formulation of relevant questions. The combination of fixed-response questions and open-ended questions made it possible to complement a mainly quantitative approach with a qualitative perspective (content analysis), thereby gaining valuable insights. The relatively high response rate, the characteristics of responders, and the results of the non-responder analysis indicated good representativity and precision. To our knowledge, views of cardiologists concerning evidence-based guidelines have not been systematically evaluated before, nor have their experiences and views on treating multiple-diseased elderly with NSTEMI ACS.

Despite the advantages mentioned, this kind of study can only be explorative and hypothesis generating; the results should lead to further research and policy discussions. Further, chosen definitions and semantic issues, i.e. regarding how words and terms are interpreted, can naturally influence the answers of the responders, thus making interpretations of responder attitudes and values more difficult.

In Sweden and other Western countries evidence-based guidelines are intended to play an important role in decision-making in health care. It is therefore crucial that users consider them legitimate. Our study indicates that Swedish cardiologists appreciate the national guidelines for heart disease. This constitutes crucial knowledge from a priority setting perspective. However, regarding clinical decision-making for elderly multiple-diseased NSTEMI ACS patients, individual clinical experience and patient views obviously are used to a greater extent than national guidelines. Cardiologist comments and answers to the open-ended questions strengthen the impression that the present national guidelines are considered to be of relatively limited value concerning these patients.

Given that 39% of all Swedish myocardial infarction patients are over 80 years of age (26), the cardiologists' estimates regarding numbers of elderly with co-morbid conditions seem realistic. The median age of patients in NSTEMI ACS clinical trials is 65 years; and more important, many studies exclude elderly patients with significant co-morbid conditions (27). Considering the present volume of this patient population and the demographic prognosis in Sweden and other industrialized countries, limited applicability of guidelines may constitute a major and growing health care problem. Two possible expressions of this problem would be polypharmacy when many guidelines are concomitantly adhered to, and, **in some cases**, increasing futility of prevention by drugs at very high age.

In spite of responders' awareness of evidence limitations and difficulties applying guidelines, 79% thought that these patients were justifiably prioritized, see Table II, concerning coronary angiography. One possible explanation could be that the majority of responders intuitively consider today's clinical priority setting adequate, given the present weak evidence base. In addition, interpretation of the findings is hampered by the possibility of different treatment traditions in different hospitals. Further, individual cardiologists may treat different populations of NSTEMI ACS patients, and thus have different patient characteristics in mind.

Regarding ways of improving decision-making, the above-mentioned Norwegian model for integrated care management (17) seems particularly relevant in the context of frail elderly with multimorbidity. In spite of this, the acute inpatient care episode itself, e.g. due to NSTEMI ACS, probably will remain a crucial component for the care of frail elderly, also in integrated healthcare pathways. Many respondents focused on the need for prospective treatment studies, with few exclusion criteria, on elderly NSTEMI ACS patients with multiple co-morbidities. However, the question concerning how such studies should be designed remains unanswered. Several cardiologists considered that the most important measure was to

construct specific guidelines for multiple-diseased elderly. However, knowledge about the prognostic values of co-morbidities and frailty (28-30) is limited; and so is the knowledge of how co-morbidity and frailty really should influence the decision-making for elderly.

Prospective trials with few exclusion criteria, that assess co-morbidities, cognitive status, frailty and patient preferences would be desirable. In the future, however, such studies may be rare due both to methodological and financial factors. Is it possible to condense existing practical-clinical experiences of individual experts into consensus-based guidelines regarding elderly with multimorbidity? A first step would be to identify tentative patient categories, with each category having the same index diagnosis, e.g. NSTEMI ACS, but with different patterns of co-morbidity and different degrees of frailty. Moreover, in a coming clinical prospective study regarding elderly multiple-diseased NSTEMI ACS patients we plan to evaluate how cardiologists actually prioritize in practice. We hypothesize that, given the present evidence base, there is an under-use of coronary angiography for chronologically aged patients and an over-use of the same intervention for biologically aged patients with severe frailty and/or clinically relevant co-morbidity.

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