Original article

Guideline-adherence and perspectives in the acute management of unstable angina – Initial results from the German chest pain unit registry

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A B S T R A C T

Background: We investigated the current management of unstable angina pectoris (UAP) in certified chest pain units (CPUs) in Germany and focused on the European Society of Cardiology (ESC) guideline-adherence in the timing of invasive strategies or choice of conservative treatment options. More specifically, we analyzed differences in clinical outcome with respect to guideline-adherence.
Method: Prospective data from 1400 UAP patients were collected. Analyses of high-risk criteria with indication for invasive management and 3-month clinical outcome data were performed. Guideline-adherence was tested for a primarily conservative strategy as well as for percutaneous coronary intervention (PCI) within <24 and <72 h after admission.
Results: Overall guideline-conforming management was performed in 38.2%. In UAP patients at risk, undertreatment caused by an insufficient consideration of risk criteria was obvious in 78%. Reciprocally, overtreatment in the absence of adequate risk markers was performed in 27%, whereas a guideline-conforming primarily conservative strategy was chosen in 73% of the low-risk patients. Together, the 3-month major adverse coronary and cerebrovascular events (MACCE) were low (3.6%). Nonetheless, guideline-conforming treatment was even associated with significantly lower MACCE rates (1.6% vs. 4.0%, $p < 0.05$).
Conclusion: The data suggest an inadequate adherence to ESC guidelines in nearly two thirds of the patients, particularly in those patients at high to intermediate risk with secondary risk factors, emphasizing the need for further attention to consistent risk profiling in the CPU and its certification process.

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Introduction

Timely management of acute coronary syndromes without persistent ST-segment elevation (NSTE-ACS) and particularly

troponin-negative NSTE-ACS remains challenging [1–4]. According to the 2012 European Society of Cardiology (ESC) guidelines, diagnostic procedures, initial therapy, risk stratification, and revascularization strategy invariably do not differ between non-ST-segment myocardial infarction (NSTEMI) and unstable angina pectoris (UAP). The majority of NSTE-ACS patients should undergo coronary catheterization within a time frame of 24–72 h after the first medical contact unless a conservative strategy has been chosen. The distinction between early invasive (<24 h) and invasive (<72 h) treatment depends on further risk stratification [2,5].

The implementation of specialized chest pain units (CPUs) has improved the prognosis of patients with ischemic origin of the symptoms while additionally saving financial resources [6–9]. In 2008, the German Society of Cardiology has initiated a nationwide CPU network and certified CPUs fulfilling well-defined quality-of-care criteria for prompt identification and treatment of patients with acute coronary syndromes (ACS) by use of standardized diagnostic procedures, equipment, therapeutic strategies, cooperation, staff education, and organization [10,11]. Certified CPUs are also urged to participate in the German CPU registry, which collects data on the CPU hospital-stay including e.g. demographics, clinical presentation, laboratory examination, diagnoses, time frames, and outcome [4]. So far, 40 centers from 32 cities have provided such data, thereby allowing for a real-life database on the diagnosis and therapy of ACS in Germany.

The present study analyzed the current quality of care in patients diagnosed with UAP in Germany, focusing on the choice of the time limit for an invasive strategy when necessary, the corresponding patients' demographics and risk profiles as well as the determinants for the choice of interventional or conservative therapy with respect to the guideline recommendations. More specifically, the study focused on differences in clinical outcome with respect to guideline-adherence.

Patients and methods

Study design

Given informed consent, data were obtained from the German CPU registry, which collects data from certified CPUs as certified by the German Society of Cardiology [10]. UAP was diagnosed in accordance with the guidelines of the ESC, defined as diagnosis at discharge [2]. Consecutive all-comers admitted for chest pain to one of the 30 participating CPUs were retrospectively enrolled. Only patients with complete follow-up were enrolled. The follow-up was conducted via telephone interview 3 months after the index hospitalization.

Baseline characteristics, risk factors and follow-up

The evaluation of patients' characteristics comprised basic demographics, standard risk factors, as well as relevant comorbidities and medication at discharge. Very high-risk evaluation was based on the Killip classification. High-risk stratification was based on the GRACE score in-hospital mortality as well as on electrocardiographic (ECG) analyses for the absence/presence of ST depression and/or T wave inversion [12,13]. Additional risk evaluation for less acute risk (secondary criteria) was performed by the assessment of diabetes, renal insufficiency, reduced left ventricular ejection fraction (<40%), and of cardiac history in terms of prior myocardial infarction, recent percutaneous coronary intervention (PCI), or coronary artery bypass graft (CABG) [2].

Follow-up evaluation comprised major adverse coronary and cerebrovascular events (MACCE) including myocardial infarction, stroke and, additionally coronary revascularization and rehospitalization for cardiovascular reasons.

Guideline-conforming management

The analyses for guideline-adherence included in group (a) UAP patients with PCI within the first 24 h and in group (b) patients with PCI within 72 h after admission. According to the ESC guidelines, inclusion criteria for group (a) comprised UAP patients fulfilling at least one of the urgent or primary criteria for high risk with indication for invasive management. Inclusion criteria for group (b) comprised UAP patients fulfilling at least one of the secondary criteria for high risk with indication for invasive management but none of the criteria of group (a). Group (c) included all UAP patients without characteristics of group (a) and/or (b) [2].

Statistics

The median with lower and upper quartiles was used to report continuous variables. Categorical variables were described by absolute frequencies and percentages. The classical (Pearson's) Chi-square test for dichotomous variables and a Kruskal–Wallis rank test for metrically scaled variables were used. Differences were considered significant at a level of 0.05, without adjustment for multiple testing. All statistical analyses were performed using SAS version 9.3 (SAS Institute Inc., Cary, NC, USA).

Results

From December 2008 to July 2013, 1400 patients who had been entered into the German CPU registry with a completed follow-up fulfilled the inclusion criteria for the final diagnosis of UAP.

PCI was conducted in 37.0% ($n = 518$) of these patients. Early elective invasive strategy with PCI within the first day of hospitalization was performed in 24.6% ($n = 344$ median 22:34 h), in 1.4% of those ($n = 19$) an urgent invasive strategy was initiated within 2 h after admission. Late elective invasive strategy with PCI within 72 h after admission was performed in an additional 12.4% ($n = 174$, median 49:30 h).

Guideline-adherence

Overall guideline-conforming treatment – including guideline-adherent choice of invasive strategy as well as guideline-adherent choice of a primarily conservative treatment – was performed in 38.2% of the UAP patients. Patients with guideline-conforming treatment were younger (63.6 vs. 69.7 years, $p < 0.0001$) and more often smokers (34.4% vs. 27.3%, $p < 0.0001$), whereas there were no relevant differences in medication at discharge (except for dual antithrombotic therapy in the PCI subgroups).

Signs of cardiac insufficiency (1.1% vs. 6.7%, $p < 0.0001$), ECG changes (6.8% vs. 28.4%, $p < 0.0001$), GRACE score in-hospital mortality (94 vs. 110, $p < 0.0001$), diabetes (12.0% vs. 28.4%, $p < 0.0001$), renal insufficiency (5.2% vs. 8.1%, $p = 0.06$), reduced left ventricular function (3.9% vs. 10.5%, $p < 0.0001$), and prior cardiac history (49.3% vs. 74.4%, $p < 0.0001$) were more frequent in patients without guideline-conforming treatment (Table 1).

Under-/overtreatment

A guideline-conforming choice of a timely invasive strategy (PCI <24 h or <72 h after admission, respectively) was adopted in only 21.3% of the patients at risk. Only a positive history of prior PCI was associated with a guideline-conforming time interval to PCI (73.3% vs. 52.3%, $p < 0.0001$). By contrast, ST depression/T inversion (17.1% vs. 33.0%, $p < 0.0001$), Killip