



# Circadian presentation patterns and ECGs of men and women with suspected acute coronary syndrome in the emergency department

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## Background

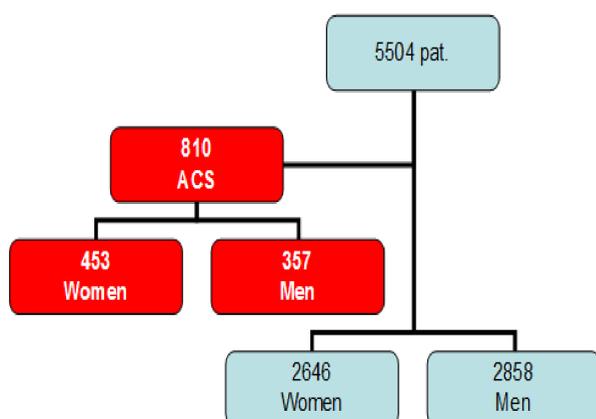
Every year, more than 180 000 Swedes present at the emergency department (ED) with chest pain or other symptoms suspicious of acute coronary syndrome (ACS; unstable angina pectoris and myocardial infarction). 15-20% of these patients are diagnosed with ACS, and most of them are men. The circadian patterns of presentation to the ED of men and women with suspected ACS are unknown. Further, studies suggest that the symptoms of ACS may be somewhat different in men and women, but nothing is known regarding possible differences in the ECG. In this study, we attempted to answer two important questions:

- Are there any differences between men and women with suspected ACS regarding which time of day they seek the ED?
- Are the ECGs different in men and women with suspected and confirmed ACS?

## Method

Using electronic patient records and statistics tools at Lund University Hospital (LUSA, PASIS, Mega-Care and QlickView software), we built a database containing all patients who presented at the Lund University Hospital ED for chest pain and suspected ACS during 2006. The database includes, among other things gender, presentation time and ECG. For the present study, data were analyzed using Excel and SPSS software. All ECG measurements were obtained by means of computerized electrocardiographs (Siemens-Eléma AB).

## Results



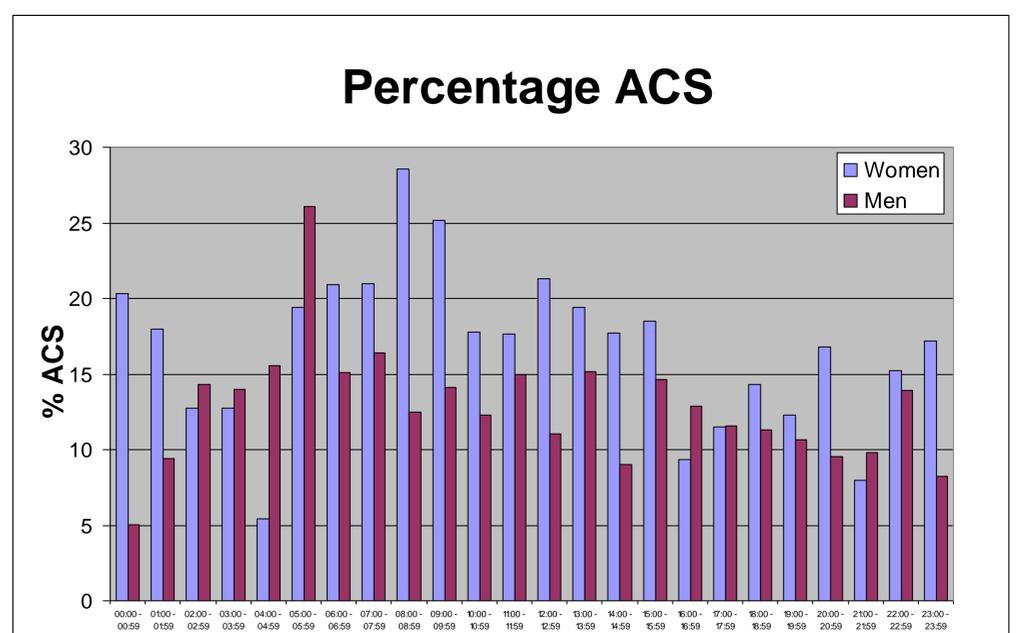
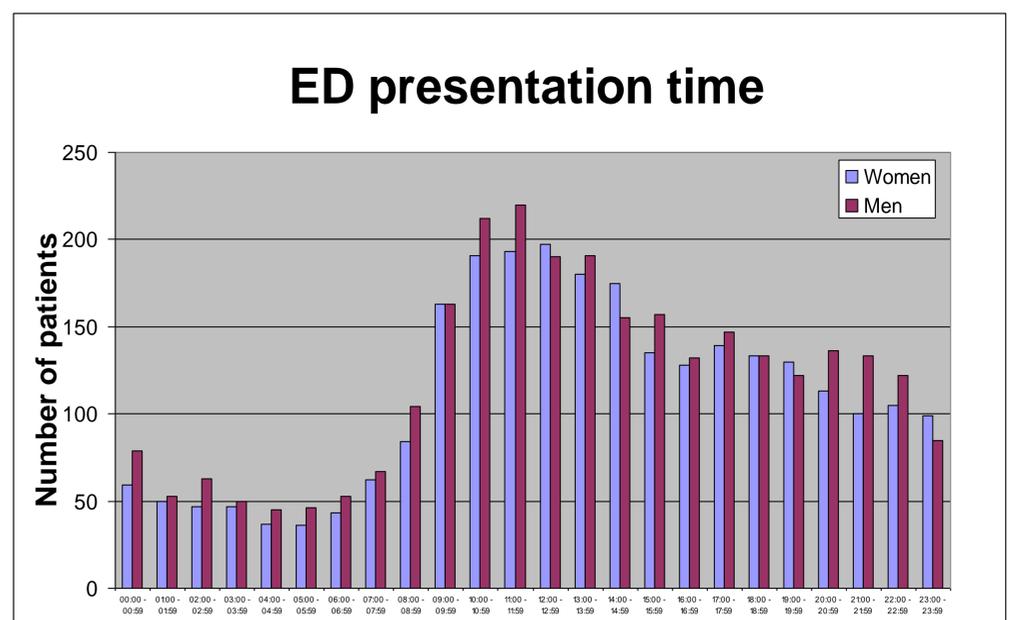
## ECG differences

Of the 5504 patients, 4819 had an electronically saved ECG. Among these 719 (15%, 393 women) had ACS. In men compared to women, QRS-duration was on average longer (101 vs 92 ms) and QRS axis more leftward (15,6 vs 20,9 degrees). Of those with a normal QRS duration (<120 ms; n=4255), many more male (n=580) than female (n=134) patients met the traditional ST-elevation criteria for ACS (ST elevation >1 mm in two or more contiguous leads, with > 2 mm in V1-3), but only 7 % of these males vs 27% of

these females had ACS. The traditional ST-depression criteria for ACS (ST depression >1 mm in two or more contiguous leads) were met by 127 females and 110 males, of which 34% and 31% had ACS.

## Presentation pattern

Men and women had similar presentation patterns, with 41,5 % of all women and 39,6 % of all men presenting between 09.00 and 15.00, which included 47,9 and 39,6 % of all ACS cases. The largest likelihood of ACS was found between 08:00 and 09.00 (28,6%) for women, and between 05:00 and 06:00 (26,1%) for men.



## Conclusion

Presentation patterns were quite similar for men and women with a large likelihood of ACS for those presenting in the morning. This may be related to changes in the thrombolytic activity, platelet aggregability and sympathetic system activation.

In patients with ECG signs of ST elevation ACS, the likelihood for ACS was much smaller for men than for women. This can perhaps be explained by differences in the size of the heart, and in the anatomy and electric properties of the thorax. There may be a need for different ECG criteria for ACS for men and women.