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## Hellenic Journal of Cardiology

journal homepage: <http://www.journals.elsevier.com/hellenic-journal-of-cardiology/>

## Correspondence

## Reduction of acute myocardial infarction (AMI) hospital admissions in the region of Messinia in Greece during the COVID-19 lockdown period



**Keywords:**  
 COVID-19  
 pandemic  
 lockdown  
 acute myocardial infarction (AMI)  
 hospital admission

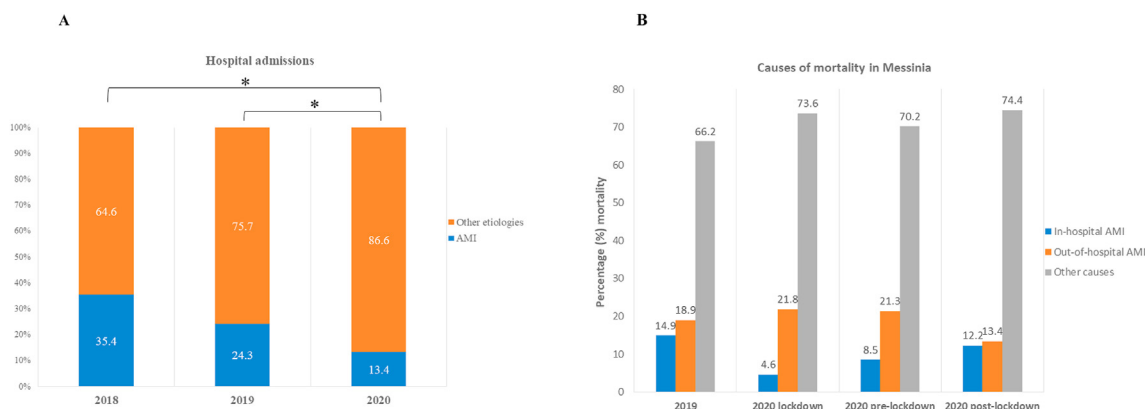
Greece acted fast during the coronavirus disease-2019 (COVID-19) pandemic by implementing complete lockdown measures thus reducing its incidence and mortality.<sup>1,2</sup> Healthcare professionals predicted a possible reduction in hospital admissions of patients with acute myocardial infarction (AMI) because of the fear of infection. The aim of the study was to assess whether there was a reduction in AMI hospital admissions in the region of Messinia in Greece during the Covid-19 lockdown period and its possible relation with the mortality of these patients.

We conducted an observational survey that aimed to evaluate consecutive patients with AMI who were admitted to the Cardiology Department of the Messinia General Hospital (300-bed hospital in Kalamata, serving 170,000 people in Messinia), throughout the period of the lockdown in Greece from 10 March to 3 May of

2020 and for the same periods of 2018 and 2019. Moreover, data with regard to the out-of-hospital and the in-hospital mortality of AMI in Messinia was collected from the registry office of the Town Hall of Kalamata for the period of the lockdown in 2020 and for the respective period in 2019 as well as for the same time period of 55 days before and after lockdown in 2020. The cause of death was stated on each patient's death certificate after autopsy.

Categorical variables are presented as absolute numbers or percentages and compared by using the chi-square ( $\chi^2$ ) test. Post hoc comparisons with the  $\chi^2$  test and appropriate correction of the p value were also employed to explore between-year differences. Continuous variables are presented as median (25<sup>th</sup>-75<sup>th</sup> percentiles) compared by using the Kruskal Wallis test for independent samples. All tests were two-tailed and the level of statistical significance was set at 0.05. Statistical analyses were performed with IBM SPSS 25 Statistics.

Admission of patients with AMI reduced within the lockdown period of 2020, which indicated a significant decrease as compared to the respective periods of both 2018 and 2019 (Fig. 1A). The main characteristics of these patients did not differ among these years (Table 1). In-hospital and out-of-hospital mortality of patients with AMI among the pre-lockdown, lockdown and post-lockdown periods of 2020 as well as between 2019 and 2020 remained unchanged (Fig. 1B).



**Figure 1.** A. The percentage of AMI and other hospital admissions at the General Hospital of Messinia in 2018, 2019 and 2020. The asterisk (\*) indicates a statistically significant difference between 2018 and 2020 as well as between 2019 and 2020 for AMI hospital admissions ( $p < 0.05$ ). B. In-hospital and out-of-hospital mortality of patients with AMI in the region of Messinia among pre-lockdown, lockdown and post-lockdown periods of 2020 and between the same periods of 2019 and 2020. No difference was observed for the in-hospital and for the out-of-hospital mortality between 2019 and 2020 as well as among the pre-lockdown, lockdown and post-lockdown periods of 2020 ( $p > 0.05$ ).

Peer review under responsibility of Hellenic Society of Cardiology.

<https://doi.org/10.1016/j.hjc.2020.10.003>

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**Table 1**

Demographic characteristics of patients with acute myocardial infarction admitted to the Cardiology Department of the Messinia General Hospital during the Covid-19 lockdown in 2020 and the respective periods of 2018 and 2019. No differences were observed among these years ( $p > 0.05$ )

Demographic characteristics	2018	2019	2020
Gender (Males/Females)	41/15	40/4	27/4
Age (years) <sup>a</sup>	71 (60 - 82)	73 (63 - 86)	66 (57 - 76)
Days of hospitalization (days) <sup>a</sup>	5 (4 - 7)	4 (4 - 7)	5 (3 - 7)
<b>Type of AMI</b>			
STEMI (%)	28.6	27.3	19.4
N-STEMI (%)	71.4	72.7	80.6
<b>Outcome</b>			
Improvement (%)	96.4	86.4	87.1
Death (%)	1.8	9.1	0.9
Transfer (%)	1.8	4.5	12.0

AMI, acute myocardial infarction.

<sup>a</sup> Values are expressed as median (25<sup>th</sup> –75<sup>th</sup> percentiles).

A dramatic reduction in the number of hospitalisations for AMI were observed in countries, which included Italy<sup>3</sup>, USA<sup>4</sup>, Germany<sup>5</sup>, UK<sup>6</sup> and China<sup>7</sup>. The fear of contagion at the hospital could be one potential mechanism, which discouraged patients to get admitted at the emergency medical services. As a result, they would present AMI at home thus increasing the out-of-hospital mortality. Through our results, this potential mechanism does not seem to explain this phenomenon as the mortality of patients with AMI out of hospital did not differ in comparison with the previous year or the pre- or post-lockdown periods. Moreover, the in-hospital mortality due to AMI also remained unchanged. Another potential mechanism, based on the relation of physical and emotional stress and acute cardiovascular events<sup>8</sup>, is that lockdown and measures of social distancing resulted in working from home thus reducing the work stress, and probably the stress burden of daily life, and leading to less acute cardiovascular events in parts of the general population.

The present study demonstrated that hospital admissions of patients with AMI decreased during the Covid-19 pandemic as compared to previous years. It also showed that in-hospital and out-of-hospital mortality of these patients remained unchanged before, during and after the lockdown in 2020 as well as between the respective time periods of 2019 and 2020. It is the first study to relate the reduction of hospital admissions of AMI and the mortality of AMI in hospital and out of hospital. An important limitation is the fact that results from a single region with limited number of events cannot be generalisable to the entire Greek population. In the light of these findings, there is an urgent need to conduct an international representative multicentric study to evaluate the potential impact of the pandemic on the incidence of AMI in combination with the potential mechanisms.

### Funding

None.

### Conflict of interest

The authors declare that there is no conflict of interest.

### Acknowledgements

None.

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29 August 2020

Available online 7 November 2020

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