Original Article

The effect of financial crisis on the profile of the patients examined at the surgical emergencies of an academic institution in Greece

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Background: Greece is suffering an economic recession of enormous magnitude, but whether its health has deteriorated as a result, has not yet been well established. We aim to present and analyze differences in demographics and clinical distribution of patients examined at the emergency room (ER) in the era of financial crisis.

Methods: A retrospective data analysis of all patients that were examined to surgical ER, between January 1st 2008 and December 31st 2014, was conducted. We only analyzed and evaluated data for the years 2008, 2011 and 2014. We evaluated the etiology of the examination (main complaint of the patient), the gender, the ethnic origin, the age and the severity of the disease, whenever it was feasible. The diseases that presented differences that were statistically significant were analyzed in terms of medical, social and financial aspects.

Results: The number of patients being examined in the ER in 2011 was higher compared with that of 2014 and to 2008 respectively (P<0.05). Throughout the years, there was a decline in vascular emergencies (veins, arteries, AAA; P<0.05). An increased incidence of soft tissue infections (STIs) was also found (P<0.05). Finally, an increased incidence of anal diseases and patients with abdominal pain was also noted (P<0.05).

Conclusions: Financial crisis seems to have a multivariable effect on epidemiology and clinical diversity of patients being examined in the ER.

Keywords: Financial crisis; emergencies; Greece

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Introduction

Greece is currently suffering a severe financial crisis affecting all parts of life. The recession is the outcome of specific policies that were applied in the form of economic adjustment programs in exchange for financial assistance (1). Reductions in public expenditure were of the cornerstones of the programs and the Greek National Health System (GNHS) could not be excluded from these measures (from 10% to 6% of annual GDP). The GNHS has had long identified problems which appear now augmented due to the current economic situation (1-6).

Greece has faced this prolonged crisis with unemployment rising steeply in 2010 and 2011, showing poor prospects of immediate recovery. Previous studies suggested that conditions that intensify during recessions such as unemployment, involuntary job-loss and job insecurity may have a negative impact on health (7-10).

Unpublished experience from the acute hospitals in Athens has been that the number of the patients seeking medical help during the years of the crisis increased and their profile and the reason for attendance have shifted. The poorest socioeconomic groups, often including immigrants and unemployed, face difficulties in accessing healthcare

Table 1 Distribution of the patients per cause of attendance at the ER

Causes for examination in ER	Year					
	2008		2011		2014	
	Count	Column N %	Count	Column N %	Count	Column N %
RLQP	190	5.9%	202	5.5%	165	5.3%
GIB	45	1.4%	24	0.7%	18	0.6%
AAA	60	1.9%	5	0.1%	21	0.7%
Miscellaneous	1573	49.2%	1615	44.1%	1478	47.5%
Arteries	154	4.8%	67	1.8%	74	2.4%
Intestinal obstruction	27	0.8%	30	0.8%	31	1.0%
Wound/injuries	328	10.3%	664	18.1%	371	11.9%
Jaundice	84	2.6%	30	0.8%	38	1.2%
Hernias	82	2.6%	106	2.9%	111	3.6%
Abdominal pain	272	8.5%	442	12.1%	343	11.0%
STIs	100	3.1%	191	5.2%	203	6.5%
Abuse	20	0.6%	79	2.2%	48	1.5%
Anal	34	1.1%	31	0.8%	67	2.2%
Veins	229	7.2%	175	4.8%	143	4.6%

ER, emergency room; RLQP, right lower quadrant pain; GIB, gastrointestinal bleeding; STIs, soft tissue infections; AAA, abdominal aortic aneurysm.

services and seek help only at progressed stages of diseases. Besides, regular pre-symptomatic check-up programs are abandoned and patients with medical conditions which were traditionally treated in private hospitals-such as gynecological diseases–now seek help in the public sector.

The aim of this report is to investigate the empirically observed but still unconfirmed change of the profile of patients seeking emergency help in a public acute hospital during the years of the crisis.

Methods

Study design

A retrospective database analysis of all patients that were examined to surgical emergency room (ER), between January 1st 2008 and December 31st 2014, was conducted. We only analyzed and evaluated data for the years 2008, 2011 and 2014. This classification was made based on the fact that the peak of financial crisis, that Greece was encountered with, was during 2011. In 2008, the need for financial support and mechanism for financial stabilization was not apparent, and the year 2014 was the end-point of the financial program with the agreement of controlled exit to the markets.

The healthcare system of on-duty shifts that our department participates in stands for a 17-hour or 24-hour shift every 8 days. The area covered per shift is the Municipality of Attika, Central Greece (around 3 million population) and the majority of the regions of Central Greece (another 1.5 million population). This burden of potential patients is directed to our Hospital since it is a tertiary center.

We collected data regarding gender, age and ethnic origin [Greek origin (GO), Foreign origin (FO)] as well as the reason for attendance/primary diagnosis. Primary diagnoses were grouped in wider entities to facilitate analysis as shown in *Table 1*. Statistical analysis attempted to correlate parameters to each other and the year examined. We further analyzed and presented only the categories of the diseases that presented differences that were statistically significant and we tried to give an explanation on them

Table 2 Demographic data of our study

Year	2008	2011	2014
Patients in total	3,190	3,501	3,083
Gender			
Male	1,787	1,898	1,623
Female	1,403	1,603	1,460
Age (years)			
Median	48, 97± Std.	45, 32± Std.	49, 29± Std.
Dev.	21, 132	20, 260	20, 828
Ethnic origin			
Greeks	2,625	2,875	2,621
Foreigners	568	779	488

Std., standard; Dev., deviation.

under medical, social and financial angle. Ethics approval (ID: 0783341) was obtained by Ethical Review Board of "Laikon" General Hospital of Athens.

Statistical analysis

Data are expressed as mean ±1 standard deviation (SD). Comparisons were performed using Student's T-Test, Mann-Whitney's U test and Chi-test. Comparisons between multiple time points were performed using Repeated Measures ANOVA. All tests were two-sided. Differences were considered as statistically significant if the null hypothesis could be rejected with >95% confidence (P<0.05).

Results

The number of patients being examined in the ER in 2011 was higher compared with that of 2014 and to 2008 respectively (P<0.05). In 2011, 3501 reached the ER whereas in the other years the numbers were almost identical (*Table 2*).

The number of men visiting ER during the years was higher than that of women (P<0.05) with the absolute number of men remaining almost constant. Interestingly, the percentage of men was decreasing throughout the years (56% *vs.* 54.2% *vs.* 52.6%) whereas the percentage of women presented a significant increase (44.0% in 2008 compared to 47.4% in 2014; P<0.05). The majority of men reaching ER were GO, with the higher percentage of them being found in 2014 (84.3%; P<0.05 compared to the other years), whereas in women, no significant difference was found throughout the years.

The number of GO being examined in the ER was higher than that of FO (P<0.05). In 2011, there was a significant decrease in the percentage of GO being examined in the ER compared to that of 2008 (78.7% *vs.* 82.2%; P<0.05) whereas in 2014, the percentage returned to the level of 2008 differing statistically significant to that of 2011 (84.3% *vs.* 78.7%). As far as the FO are concerned, there was an increase in the absolute number and the percentage of patients examined in the ER in 2011 (779, 21.3%) compared with the numbers of 2008 and 2014 (568, 17.8% and 488, 15.7% respectively). There was also a statistically significant increase of the percentage of FO women in 2014 compared to 2011 and 2008 (45.4% *vs.* 35.8% *vs.* 31.4% respectively; P<0.05).

The mean age in 2011 was 45.32 years (range 14–99 years) which was significantly lower of the mean age in 2014 (49.29 years; range 13–100 years; P<0.05) and in 2008 (48.97 years; range 14–100 years; P<0.05). The age presented diversity among the different subgroups. More specifically, the subgroup of GO patients that reached ER in 2011 were younger than those being examined in 2008 and 2014 respectively (mean age in 2011: 48.17 years, mean age in 2008: 51.85 years, mean age in 2014: 51.03 years; P<0.05). On the other hand, older FO patients were examined in the ER in 2014 compared to the years before (mean age in 2014: 40.34 years, mean age in 2011: 34.17 years, mean age in 2008: 35.44 years; P<0.05). The difference of the mean age between patients of different origin was significant at the level of 0.05 (GO older than FO).

In 2011, younger men were examined in the ER (mean age in 2011: 44.68 years, mean age in 2008: 47.80 years, mean age in 2014: 49.78 years; P<0.05). The same tendency was also found in the subgroup of women (mean age in 2011: 46.90 years, mean age 2008: 50.43 years, mean age 2014: 48.80 years; P<0.05). Moreover, men were younger than women (P<0.05).

Analysis per category

We evaluated only the causes of attendance at the ER that presented significant change of the number or/ and profile throughout the years of the crisis. We must highlight the fact that despite our Hospital being thought as a tertiary center, it cannot support major traumas (car crashes, blasts etc.) due to lack of neurosurgical coverage. So, the small number of these cases were classified

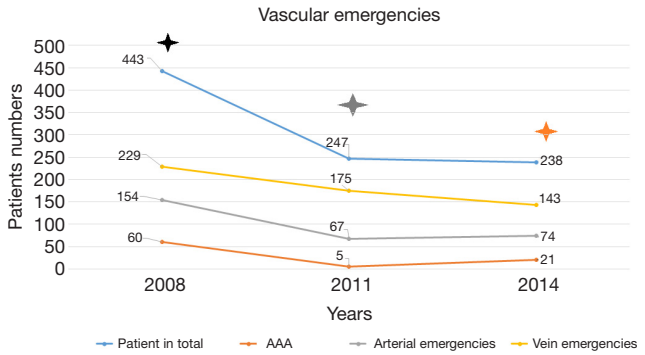

Figure 1 Vascular emergencies. X-axis refers to year and y-axis refers to number of patients. Black, gray and orange stars indicate statistical significance at the level of 0.05. Blue line, total number of patients with vascular emergencies; yellow line, number of patients with venous emergencies; grey line, number of patients with arterial emergencies; orange line, number of patients with AAA. AAA, abdominal aortic aneurysm.

to miscellaneous category. Moreover, minor surgical emergencies such as abscesses, sebaceous cysts were also classified to miscellaneous category. This is the reason why miscellaneous category counts the majority of cases.

Throughout the years, a decline in total vascular emergencies as well as per category was noted (*Figure 1*, *Table 1*). In 2008, the number of AAAs that were examined in the ER was 60 whereas in 2011 it rapidly fell down to 5 cases and came back to 21 cases in 2014 (P<0.05 to all comparisons respectively). All patients with AAAs were GO (no case of AAAs in FO throughout the years) and only three cases of AAAs in 2008 were women. Moreover, the cases of arterial emergencies in 2008 reached the level of 154 whereas they fell at the level of 67 in 2011 and the number of cases was practically constant in 2014 (74; 2.4%) (P<0.05). In 2008, almost 94% of these cases were GO whereas in 2011 the percentage fell in 91% and remained almost constant in 2014 (90.50%). The differences of 2014 and 2011 compared with 2008 were statistically significant (P<0.05). As far as gender distribution is concerned, 66.90% of the patients were men in 2008, with a marked increase to 76.11% in 2011 and almost the same picture in 2014 (78.37%). The differences of 2014 and 2011 compared with 2008 were statistically significant (P<0.05). Finally, as far as venous emergencies (DVT, varicose vein bleeding) are concerned, there was also a peak in 2008 of 229 cases whereas there was a decrease in 2011 at the level of 175 cases with a tendency to stabilize in 2014 at the level of 143 cases (P<0.05). In 2008, almost 89.50% of the cases were GO whereas in 2011 the percentage fell in 86.3% and increased in 2014 to 90%.

Moreover, an increased incidence of soft tissue infections (STIs) was found (*Figure 2*). In 2008, 100 cases were examined in the ER whereas the respective number in 2011 was 191 and in 2014 they reached 203 (P<0.05). The majority of the patients were GO in 2008 (70%), with increase of the percentage in 2011 (82%) (P<0.05) and in 2014 (80%). The majority of the cases were men in 2008 (60%), with decrease of the percentage in 2011 down to 53% and constant percentage in 2014 (53%). So, despite the increase in the absolute number of STIs in men, the percentage of the cases decreased significantly (P<0.05) which is attributed to the rapid increase in cases of STIs in women. Of interest, a concomitant increase in the severity of STIs was noted since 60% of the STIs cases examined throughout the years of crisis were neglected STIs where the admission for intravenous antibiotics and/or surgical intervention was mandatory.

Furthermore, an increased number of patients with anal diseases visiting ER were noted. In 2014, the number of patients was 67 whereas in 2011 and 2008 the cases were around 30 (P<0.05). The majority of patients throughout the years were men (82% in 2008, 51% in 2011 and 53% in 2014) with a constant increase in the number and the percentage of women during the same period (P<0.05). The majority of the cases were GO (65% in 2008, 68% in 2011, 76% in 2014) (P<0.05) (*Figure 3*).

As far as the cases of abdominal pain are concerned, there was also a difference throughout the years. In 2008, the number of patients reaching ER complaining about abdominal pain was 272 whereas in 2011 they were 442 and in 2014 were 343. The increase of the cases throughout the years was statistically significant (P<0.05). The majority of these cases were GO (82.3%) in 2008 with the percentage being slightly increased in 2011 (83.9%) and further increased in 2014 (86.3%). The differences were also statistically significant (P<0.05). As far as the gender distributions are concerned, the percentage of men reaching ER with abdominal pain was 40% whereas the respective percentage in 2011 was 44.6% and 43.7% in 2014 (P<0.05) (*Figure 4*). Of interest, 43% of the cases of abdominal pain were neglected cases (abdominal "catastrophes") that needed immediate surgical intervention.

Discussion

Since the first bailout request from the Greek government

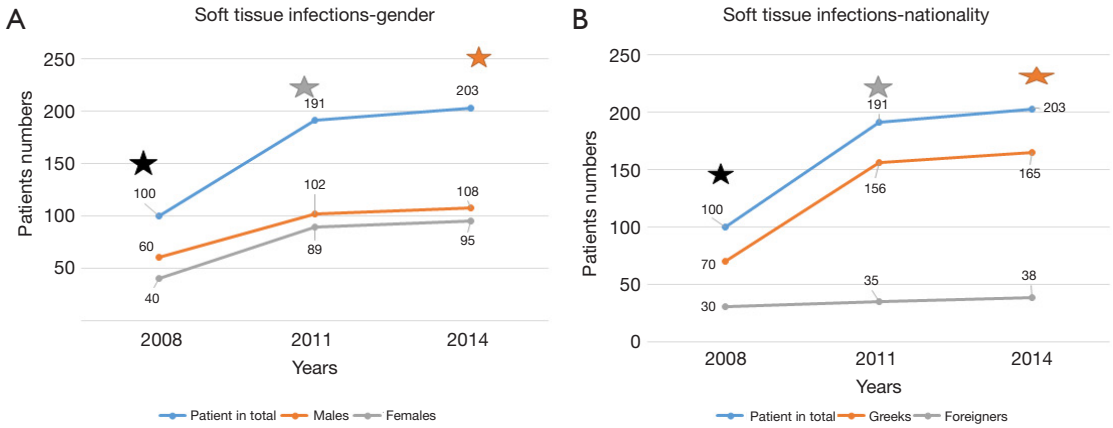

Figure 2 STIs cases. (A) STIs classified by gender. Blue line, total number of patients with STIs; orange line, number of male patients with STIs; gray line, number of female patients with STIs. X-axis refers to year and y-axis refers to number of patients. Blue, gray and orange stars indicate statistical significance at the level of 0.05; (B) STIs classified by nationality. Blue line, total number of patients with STIs; orange line, number of Greek origin patients with STIs; gray line, number of foreign origin patients with STIs. X-axis refers to year and y-axis refers to number of patients. Blue, gray and orange stars indicate statistical significance at the level of 0.05. STIs, soft tissue infections.

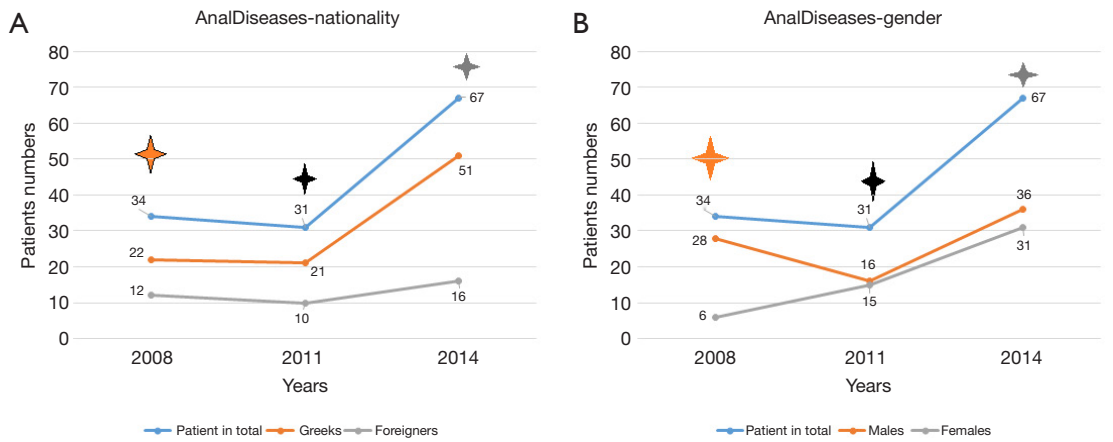

Figure 3 Anal disease cases. (A) Anal diseases classified by gender. Blue line, total number of patients with anal diseases; orange line, number of male patients with anal diseases; gray line, number of female patients with anal diseases. X-axis refers to year and y-axis refers to number of patients. Blue, gray and orange stars indicate statistical significance at the level of 0.05; (B) anal diseases classified by nationality. Blue line, total number of patients with anal diseases; orange line, number of Greek origin patients with anal diseases; gray line, number of foreign origin patients with anal diseases. X-axis refers to year and y-axis refers to number of patients. Blue, gray and orange stars indicate statistical significance at the level of 0.05.

in 2010 that led to the signing of a Memorandum of Economic and Financial Policies (11), an unprecedented financial crisis and worsened socio-economic conditions are associated with greater morbidity, less utilization of health services and deteriorated population's health status (12). Crisis also led to cuts in salaries and social benefits (insurance and pension) issues related to the austerity measures (11).

Moreover, crisis had major impact on the provision of services in public and university hospital units (5,13) in a way that several closures of healthcare units have occurred which at first seems to contribute to the rationalization of the facilities and human resources but also directs patients to larger hospital units which are unprepared to take that burden.

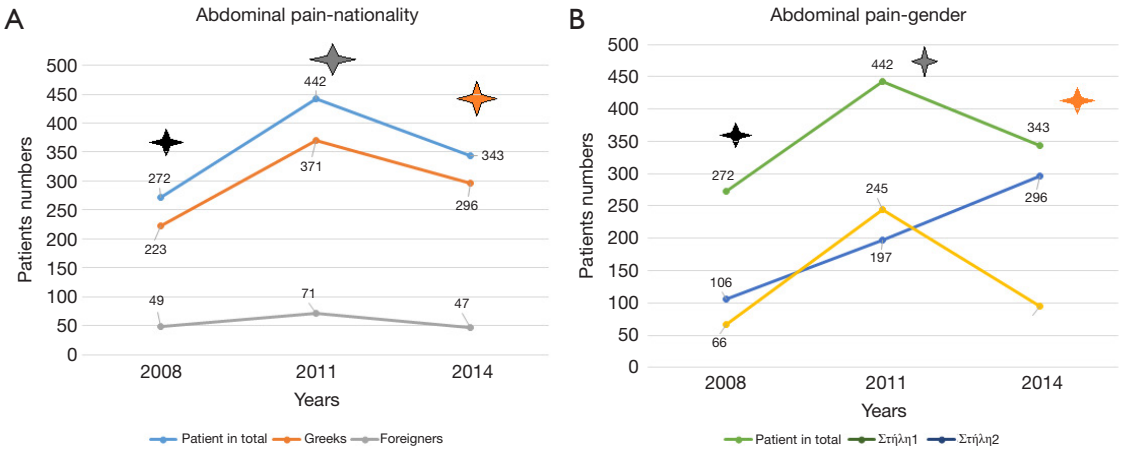

Figure 4 Abdominal pain cases. (A) Abdominal pain cases classified by gender. Blue line, total number of patients with abdominal pain; orange line, number of male patients with abdominal pain; gray line, number of female patients with abdominal pain. X-axis refers to year and y-axis refers to number of patients. Blue, gray and orange stars indicate statistical significance at the level of 0.05; (B) abdominal pain cases classified by nationality. Blue line, total number of patients with abdominal pain; orange line, number of Greek origin patients with abdominal pain; gray line, number of foreign origin patients with abdominal pain. X-axis refers to year and y-axis refers to number of patients. Blue, gray and orange stars indicate statistical significance at the level of 0.05.

At the same time, increased number of Greeks have reported that they do not seek healthcare examination or treatment even though they believe it is necessary for them (1,14,15), because of the cost, waiting time and travel distance (9). The surgical community is concerned by the significant reductions in health expenditure followed by lack of appropriate equipment for surgical interventions, resulting in problematic provision of surgical healthcare services and thus deterioration of surgical patients' health (16).

There are also earlier findings suggesting that health has deteriorated in Greece during recent years (1,12) but further strengthen the conclusion that unfavorable health trends appear to be indeed attributable to the crisis. The crisis may have led to reduced access to care, in turn leading to physical health deterioration.

In the same tune, changes in admission rates had a shift from private towards public healthcare sector, as shown by a rise of 24% of the number of admissions to public hospitals in 2009–2010, continuing to rise also in 2011 by 8%, whereas in 2009–2010 there was a decrease of admissions to private hospitals by 25–30% because patients could no longer afford private care (1,11,14,16-18). Moreover, an increasing number of Greeks seek medical advice from street clinics which were previously used mainly for providing care to undocumented migrants (1,19), with a growing number of uninsured immigrants treated by the GNHS (18,20).

In that frame, we analyzed the data retrieved from the patients examined in our ER, focusing on how financial crisis affected the profile of the patients. The fact that the number of GO reaching ER in 2011 was lower than that in 2008 could be attributed to the fact that crisis discouraged them to be examined because many of them got unemployed and lost their medical insurance. On the other hand, more FO got examined during the same period. This could be explained by the fact that foreigners were usually treated in private institutions and because they were the first victims of the crisis (first to lose their jobs), they turned into the public hospitals for medical services.

It is clear that vascular emergencies are of male and GO predominance. It could be probably explained by the more "atherogenic" lifestyle that males and GO follow (smoking, fatty diet). The GO patients with venous diseases were fewer and fewer during the era of crisis but its percentage was very high and variable. The differences in vascular emergencies could be attributed to variable compliance to screening tests. The effect of screening on diagnosis, progression and management of a disease is a long-term project, so the results of adequate examination in the era of financial growth could explain the rapid decrease of the vascular emergencies in 2011 and the inhibition of this tendency after 2011. Moreover, due to the establishment

of vascular centers in urban Greece, less volume of vascular emergencies were directed into our center.

The increase in the cases of STIs should be attributed to the fact that crisis led to unemployment and abolishment of medical insurance in patients, which led to inability of the medical services to prescribe antibiotics early on the clinical course of a STI. As a result, more and neglected cases reached the ER and therefore, more admissions took place.

The higher incidence of anal diseases visiting ER after 2011 could be attributed to the fact that surgery for anal diseases is thought as minor operation that was mainly directed and treated in private institutions as one-day clinic. After the blow of the crisis, this number of patients that were mainly GO and especially women, were directed to public hospitals. So, the main contributing subgroup of that increase is GO women.

Interestingly, there was an increase in the absolute number and percentage of the patients reaching ER with abdominal pain. As it was expected, the majority of cases were women but the cases of men were increasing throughout the crisis. Additionally, more GO were examined for abdominal pain. The subgroup of patients mainly contributing to these differences were GO men. This finding could have two possible explanations. First of all, the cases of minor severity who usually preferred to being examined in private hospitals (less bothersome, more convenient, no waiting time) could not afford to pay the fees for the routine check-up and were directed to the public health care services. On the other hand, the severe cases of abdominal pain (which were increased during the crisis based on the qualitative analysis of our data) were neglected cases of abdominal pain requiring almost immediate surgical treatment. This could be translated into that patients trust the public health care system when they seek for urgent, reliable and multidisciplinary approach of their health problems.

Conclusions

Financial crisis seems to have a multivariable effect on epidemiology and clinical diversity of the patients being examined in the surgical ER. Crisis directed surgical patients to public healthcare sector in severe diseases as well as in cases that were previously treated in private units.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Ethical Statement: Ethics approval (ID: 0783341) was obtained by Ethical Review Board of "Laikon" General Hospital of Athens.

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