

Short Research Communication

## Potential Impact of the Financial Crisis on Outpatient Hospital Visits due to Otorhinolaryngologic Disorders in Crete, Greece

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### Abstract

The public health effect of financial crises has been emphasized in previous studies. In addition, a series of otorhinolaryngologic disorders and manifestations has been related to psychological factors in the literature. Such conditions include temporomandibular joint disorders, laryngopharyngeal reflux, chronic tinnitus, and vertigo. Focusing on the outpatient database records of a large hospital in Crete, Greece, the objective of this retrospective study was to explore possible occurrence variations within the prementioned otorhinolaryngologic morbidity which may be potentially attributed to increased levels of socioeconomic stress. Results revealed that although the total number of visits between two periods – before and after the beginning of the financial crisis in Greece – was comparable, a significant increase in the diagnosis of two disorders, namely vertigo and tinnitus was found. In addition, a trend toward increased rate of diagnosis for reflux and temporomandibular joint disorders was noted. Potential implications of these findings are discussed. In conclusion, health care providers in this as well as in other countries facing similar socio-economic conditions should be aware of potential changes in the epidemiologic figures regarding specific medical conditions.

Key words: Financial crisis, socioeconomic stress, anxiety, temporomandibular joint, depression, tinnitus, vertigo, reflux

After years of an apparently sustained economic growth, Greece went into recession in 2009. By the end of 2009, the Greek economy faced the highest budget deficit and government debt to Gross Domestic Product ratios in the European Union. Following increased anxiety about excessive national debt in international financial markets at the beginning of 2010, the Greek government requested that a European Union - International Monetary Fund bailout package be activated at the end of April 2010. As a result, a series of severe austerity measures was announced and implemented on the Greek population giving rise to significant social turmoil. Since then,

continuous revisions of deficit and debt levels have made accomplishment of targets even harder indicating a recession constantly harsher than originally feared. Austerity measures have been repeatedly imposed leading to nearly unprecedented social unrest and frustration which has been further solidified by a public feeling of political inadequacy and corruption, high unemployment levels, poverty, business deceleration, and even possibility of national bankruptcy.

The public health effect of financial crises has been previously emphasized [1]. Correlations between unemployment and suicide or alcohol abuse rate increases have already been reported [1]. More-

over, the first effects of the Greek financial crisis on public health have been published recently. These effects are becoming reasons for major concern [2]. Among other findings, a significant increase in bad self-reported health and unmet medical or dental care needs have been noted [2]. In addition, increases in suicides and HIV infections have been found to occur, drawing, overall, a negative health picture for the country [2].

A series of otorhinolaryngologic disorders and manifestations has been previously related to psychological factors in the literature. These include, but are not limited to, temporomandibular joint disorders, laryngopharyngeal reflux, chronic tinnitus, and vertigo [3-9]. Patients with reflux disorder often report an association between an increase in their symptoms and stressful circumstances. In fact, studies have indicated that anxiety and depression are strongly associated with reflux symptoms and patients may show low response rates to traditional treatments when under stress [3,4]. In addition, psychological factors linked to pain sensitivity might influence temporomandibular joint disorder risk and this condition has also been associated with symptoms of anxiety and depression [5,6]. Moreover, the role of emotional, cognitive and psychosocial factors in maintaining distress has been emphasized in tinnitus models [7,8]. Finally, previously reported data support the hypothesis that distressed patients may perceive a stronger rotational vertigo and unsteadiness if a vestibular dysfunction occurs, and, therefore, vestibular disability may be closely associated with psychological distress [9,10].

This study aimed to explore possible occurrence variations within specific otorhinolaryngologic morbidity between the years 2009 and 2011. Such variations could be related to increased levels of socioeconomic stress that has been evident in Greece during this period. For this purpose, information was retrospectively collected from the records of the outpatient ordinary visits of the Department of Otorhinolaryngology - and by excluding the registry of the Emergency Department - at the University General Hospital of Heraklion in Greece. Data regarding the rate of new diagnoses for vertigo, tinnitus, reflux, and temporomandibular joint disorders, as main reasons for seeking care, were collected and compared between two similar time periods, i.e. the first semester of 2009 - before the onset of the domestic financial crisis - and the first semester of 2011 - well after the beginning of the crisis. Other diagnoses that may cause tinnitus or vertigo but should not be related to increased anxiety, such as acoustic neuroma and trauma, were not specifically excluded since they are expected to be epi-

demologically comparable between the two time periods and therefore not affect results. Data were compared using Pearson's chi square test and p values less than 0.05 were considered significant.

Results revealed that although the total number of visits between these periods was comparable, a significant increase in the diagnosis of two disorders, namely vertigo and tinnitus was noted, as shown in table 1. Vertigo was 1.3 times more common in 2011 than in 2009 (Odds Ratio: 1.26, 95% Confidence Interval: 1.06-1.51). Tinnitus was 1.7 times more frequent in 2011 than in 2009 (Odds Ratio: 1.74, 95% Confidence Interval: 1.21-2.50). In addition, a trend toward increased rate of diagnosis for reflux and temporomandibular joint disorders did not meet statistical significance. It should be noted here that standard diagnostic algorithms and criteria for the previously mentioned disorders exist in this center and no changes have been introduced during the study period. It should also be stated that public primary health care services in Greek urban areas are provided mainly by the outpatient departments of regional and district hospitals [11]. The University Hospital is the largest such establishment on the island of Crete covering the majority of the local population [11]. Crete is the largest island in Greece with a population exceeding 600.000 inhabitants.

An increase in the rate of diagnosis for the mentioned disorders may reflect a similar increase in the incidence of these entities in this area. Moreover, it may be hypothesized that this increase could be associated with pronounced social anxiety and distress that has beyond doubt been witnessed around the country during the last couple of years. Designing future studies by using larger population cohorts at a national level and testing specific socio-economic variables as triggering factors might confirm this hypothesis. A special point of interest to be clarified is whether these findings concern only newly diagnosed cases as shown here or an increased rate of episodes regarding previously diagnosed patients is also likely to be expected. In addition, other issues, such as natural history and treatment response of such disorders during these "altered" socio-economic conditions may be further assessed. An important factor would be also the evaluation of a potential increase in the demand - and therefore economic cost - of specific diagnostic examinations or other procedures related to these disorders, such as audiologic and neuro-otologic testing. Parallel assessment of mental health status might be of further value. Rising economic costs for the evaluation and management of an increasing rate of related cases is certainly an issue worth to be clarified with further studies.

Not enough evidence exists so far in order to support a clear relation between the observed epidemiologic variations in specific otorhinolaryngologic morbidity and the socioeconomic crisis in Greece. Therefore, at such preliminary state, these findings may only suggest a frequency variation within specific diagnoses, observed in a dramatically changing

socioeconomic environment. Such observations should by no means be overestimated; however, health care providers in this as well as in other countries facing similar socio-economic conditions should be aware of potential changes in epidemiologic figures regarding specific medical conditions.

**Table 1:** Outpatient otorhinolaryngologic visits at the University General Hospital of Heraklion, Greece during the first semester of 2009 and 2011.

Cases of outpatient otorhinolaryngologic visits*	Period				P-value**
	2009		2011		
	n	%	n	%	
<b>Vertigo</b>					
Yes	232	6.96	298	8.65	<b>0.009</b>
No	3101	93.04	3147	91.34	
<b>Tinnitus</b>					
Yes	47	1.41	84	2.43	<b>0.002</b>
No	3286	98.59	3361	97.57	
<b>Temporomandibular Joint Syndrome</b>					
Yes	37	1.11	49	1.42	NS
No	3296	98.89	3396	98.58	
<b>Gastroesophageal Reflux</b>					
Yes	26	0.78	35	1.02	NS
No	3307	99.22	3410	98.98	

Totals for 2009: 3333 and for 2011: 3445

\*\*Pearson's chi square test

NS: non statistically significant

## Conflict of Interest

The authors have declared that no conflict of interest exists.

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