



## Pathology/Biology Section - 2013

### G5 Atherosclerosis in Youth — A Study in the North of Portugal

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The goal of this presentation is to study the prevalence and severity of atherosclerosis via autopsies performed on victims aged between 18 and 45 years of age in the North of Portugal, regardless of the cause of death, in order to better understand its impact on the Portuguese population.

This presentation will impact the forensic science community by providing information regarding the prevalence of atherosclerotic vascular disease and how it has been on the rise in developed countries, and the increasingly early onset of acute diseases caused by this phenomenon which may be fatal, particularly acute myocardial infarction or stroke. It is, therefore, essential to discover the prevalence and severity of this disease, especially in the younger population, as in the majority of the cases it is "silent" and the first manifestations of malaise may be sudden death.

International statistics indicate that by 2020, cardiovascular disease, particularly atherosclerosis, will become the leading cause of reduced quality of life due to the resultant disability, morbidity, or sudden death.

Few studies have been performed for this age group in Portugal, and investigations were based on the study of cadavers, being able to determine the prevalence and severity of atherosclerotic disease in young individuals. This will, therefore, give some knowledge as regards the prevalence of atherosclerosis in this age group in Portugal. Another objective is to determine whether results collated with the existing data in international literature of the same subject

In order to assess the extent of disease in the population, vascular tissue samples were collected from all individuals aged 18 to 45 years, regardless of cause of death, who had been autopsied at the Forensic Pathology Service of the North Branch of the National Institute of Legal Medicine.

In each selected case, some of the factors associated with this pathology were also noted: gender, age, smoking, hypertension, obesity, as well as the presence or absence of cardiovascular disease in the family history.

All legal proceedings in Portugal for sampling were observed, and in each case, collection and processing of vascular structures were performed. Particular focus was given to some arteries of larger calibers (ex: aorta, iliac artery, pulmonary artery) with analysis of the type of vascular injury (lipidic striae/atherosclerotic plaque/atheromatous calcification and/or ulceration) to compute a severity score in terms of atherosclerosis.

Arteries of lower calibers responsible for the irrigation of some important organs (ex: middle cerebral artery, coronary artery, renal artery) were also studied. All samples were stained with hematoxylin-eosin and categorized into qualitative classes of increasing severity related to the degree of arterial obstruction utilizing specific software for measuring the vascular percentage of each arterial obstruction (Image J software). The histological examination of the atherosclerotic plaque tissues included the study of its components: presence of calcification, degree of macrophagic infiltration, density of intraplaque vessels, plaque hemorrhage and some of its possible complications, such as thrombosis.

In the majority of the cases studied, manifestations of atherosclerotic disease, including cases in which no risk factors were identified prior to the arterial study were found. In some of the cases, the cause of death was directly associated with the atherosclerotic phenomenon. The results obtained through the study of the arterial specimens in order to better understand the prevalence and severity of atherosclerotic disease will be presented.

This study will also draw attention to an increasingly early onset of cardiovascular disease in the Portuguese population, which will necessitate the implementation of measures involving the control or reduction of some avoidable risk factors, namely those related to lifestyle (eating habits, physical activity, smoking, etc.), particularly in some public facilities like schools or companies.

**Atherosclerosis, Sudden Death, Portugal**