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Background

Cardiovascular diseases are a challenge for the health systems in several nations due to high mortality rate association. They accounted for 31% of deaths worldwide (1). They are the leading cause of death in people of almost all races and ethnic groups in the United States, where most deaths occurred in people under 65 years of age (2).

Studies have shown four cardiovascular conditions as responsible for most deaths including: ischemic diseases, cerebral vascular disease, heart failure, and arterial hypertension.

These pathologies are considered complex because they include modifiable and non-modifiable risk factors; the latter have been substrates for genetic studies that seek to determine which mutations are causative and susceptible to the development of cardiovascular pathologies. The aim of this study is to describe morphological and molecular findings in early cardiac deaths.

Methods

Complete autopsy of the included cases was performed. We analyzed all tissues, focusing on heart and cardiovascular system. We obtained data of morphologic findings from myocardium, coronary arteries, tissue processing and H&E staining.

Two pathologists observed them by optical microscopic. Blood, liver and spleen samples were obtained without fixation to obtain genetic material. DNA extraction and purification was performed with the PureLink™ kit of Invitrogen. To evaluate the quality of the purified genetic material.

FIGURE 1. Relation Sample type vs. DNA purity ratio

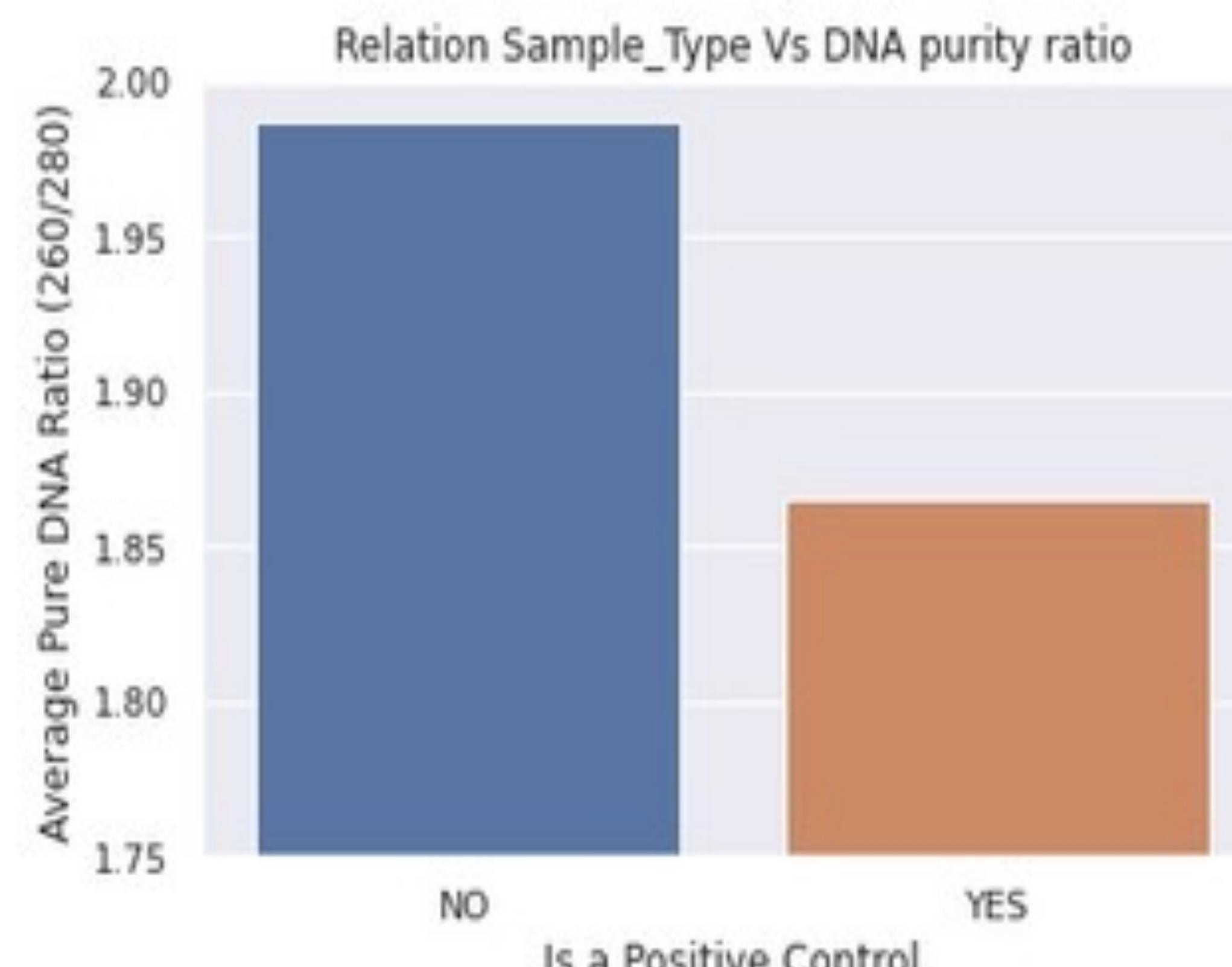


Table 1. Coronary artery stenosis grading

Coronary artery stenosis grading		
Right coronary artery stenosis	Frequency	Percentage
Grade 0	5	19.23%
Grade I	6	23.08%
Grade II	5	19.23%
Grade III	2	7.69%
Grade IV	8	30.77%
Total	26	100.00%
Left coronary artery stenosis	Frequency	Percentage
Grade 0	9	34.62%
Grade I	6	23.08%
Grade II	6	23.08%
Grade III	5	19.23%
Total	26	100.00%

Results

We examined 26 cases of unrelated early cardiac specimens obtained by necropsy. We analyzed the macroscopic and microscopic findings (See Figure 1) of the cases submitted to complete autopsy and included grading of coronary artery stenosis (See table 1). Additional findings were included and its frequency (See table 2).

Blood and unfixed tissues such as spleen and liver were obtained to extract DNA. The mean age of the cases was 50 years, minimum 26, maximum 65, mode 53, Q25 43 Q75 65 with standard deviation 10.44. From all the collected cases, 27% corresponded to women, whose mean age was 38.5 years, with a maximum age of 54 years. Among men (73% of the sample), the mean age was 54 years, with a maximum age of 65 years. The average heart weight for women was 458.5 grams, with a maximum of 750 grams and a minimum of 350 grams. For men the mean 583 grams, maximum 1150 grams, and minimum 340 grams. The average ventricular left wall thickness was 1.41 cm, with values ranging from 0.5 to 2.5 cm in both sexes. The presence of areas of acute infarction appeared more frequently in men with 90%, compared to women with 2%, OR 45 with, confidence index 96% (3.3-604), p 0.00038. For ancient infarction, there are no significant differences between men and women. A blood sample was obtained from all cases. The volume of the collected sample ranged from 1.5 to 4 ml. A DNA extract was obtained in 100% of the cases.

Comparison of the quality of the extracted material (as shown in the graph 1.) showed a higher ratio 260/280 nm. in the examined samples than in the controls.

Table 2. Additional findings of obtained cases

Additional findings	Frequency
Areas of old infarction	22/26
Areas of acute myocardial infarction	20/27
Aortic aneurysm	0/26
Dilated cardiomyopathy	3/26
Hypertrophic cardiomyopathy	11/26
Arrhythmogenic myocardiolipomatosis	0/26
Aortic atherosclerosis	15/26
Atherosclerotic aneurysm	3/26
Obesity	6/26

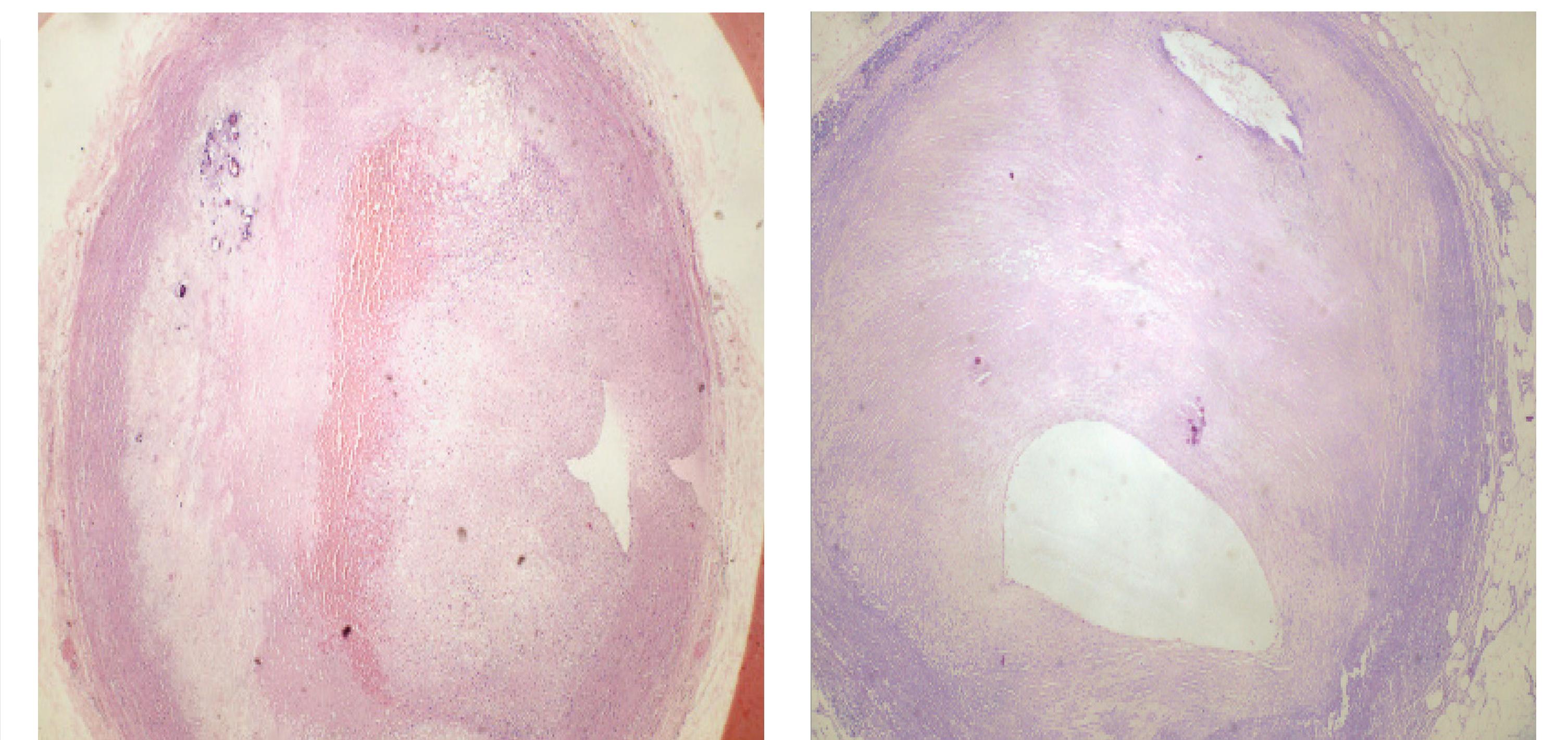


FIGURE 2. Early cardiac specimens Coronary arteries with plaques stenosing the lumen. 4X

Conclusions

We have concluded that we are moving towards the future of personalized medicine in cardiovascular diseases, in which the results of genetic tests will help us redirect the economic resources allocated to this field of public health. In addition, in the case of cardiovascular diseases, which have a potential risk of being inherited, those individuals who have a higher risk of suffering from the disease could be identified.

References

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- 2- Heron M. Deaths: leading causes for 2008. National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System. 2012 Jun;60(6):1-94.

