

Sudden Cardiac Death in Nineveh Governorate (Iraq) during the years (2010 and 2011) (Retrospective Postmortem Study)

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Abstract

Background: Sudden cardiac death (SCD) is an important challenging medical problem. It is defined as death occurring within 24 hours of an abrupt change in previous clinical status, ruling out all potentially lethal non-cardiac causes. The variability of incidence and causes of SCD in different population and absence of data in our locality, motivate us to conduct this study.

Objectives: We aim to calculate the incidence of SCD in Nineveh city, to find the underlying causes of SCD, and to study the coronary heart disease (CHD) in regard to the severity of atherosclerosis, number and type of vessels involved and the evidence of myocardial ischemia in different age groups and genders.

Patients and methods: The total number of SCD cases above 15 year in Nineveh during 2 years was 584. The autopsy and histo-pathological reports of 99 SCD cases were analyzed. The lesions of atherosclerosis were graded as mild, moderate and severe. Chi-square test was used for statistical analysis.

Results: The incidence of SCD in Nineveh is 17.6 in 100 000, aged 15–75 year. Sixty four percent were less than 40y. Male: female ratio 9:1. CHD attributed to (58%) of SCD, non-atheromatous causes (24%), and normal autopsy (18%). The causes of SCD are different before and after 40 y ($p=0.000$), (83%) of CHD aged above 40y, while (83, 88%) of Non-atheromatous and normal autopsy were less than 40 y. The atherosclerotic changes were severe in (49%) and moderate in (37%). Severity of lesion was correlated with number of vessels involved. Left anterior descending artery was most frequently and severely involved. Only (7%) show new myocardial ischemia, old ischemia found in (32%). There was no difference neither in severity, number and type of vessels nor in the myocardial ischemia between the age groups.

Conclusion: CHD is the most important cause of SCD in males of all ages, and it is the major cause of death above 40 years, this is comparable with Caucasians and Asians population and similar to previous studies. Moderate to severe atherosclerosis found in (80%) of CHD and the myocardium is normal in most of cases.

Keywords: Sudden cardiac death, Nineveh, Coronary vessels, Atherosclerosis, Autopsy, Histopathology, Myocardial ischemia.

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Introduction

Sudden cardiac death (SCD) is of continuing interest to the medical profession because of the challenges presented in its prediction and possible preventing.

Sudden cardiac death has been defined variously as death occurring instantaneously (within one minute) or within one hour, 6, 12 or 24 hours after the onset of symptoms. Sudden death defined according to the World

* The article was conducted on 2012 and finished in 2013.

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Health Organization as death occurring within 24 hours of a sudden change in previous clinical status^{1, 2, and 3}.

Morentin et al, and other numerous researchers define SCD as a sudden, unexpected, and non-violent natural death occurring within one hour of the onset of symptoms in witnessed cases, or the decedent should have last been seen alive and in stable condition 24 hour or less before being found dead for unwitnessed deaths, (with all potentially lethal non – cardiac causes ruled out)^{2,4}.

Palpitation, chest pain and dyspnea may suggest a cardiovascular aetiology^{5,6}.

Although "sudden death" is usually used for non-violent or non-traumatic deaths, various mentally or even physically traumatic events can precipitate sudden death¹.

Sudden cardiac death has a higher incidence in male than female that increases with age because of high prevalence of ischemic heart disease in older ages^{5,7}.

Although the majority of SCD is attributed to coronary atherosclerosis, other types of non-atherosclerotic cardiac disease have been associated³; cardiomyopathies, congenital heart disease, anomalous origin of coronary artery, cardiac tumors, valvular heart disease, dissection of aorta, and inflammatory conditions like sarcoid^{3,5}.

Ventricular tachycardia, ventricular fibrillation and to less extent bradycardia and asystole are responsible for sudden cardiac death⁴. Mostly, the fatal arrhythmia is triggered by electric irritability of myocardium distant from the conduction system, induced by ischemia, cellular abnormalities or infiltration^{5,8}.

Detailed postmortem examination in most of the time can determine the cause of SCD,

but the pathologist may face a great difficulty in some cases, especially when the hearts appear normal to the naked eye⁵.

Many of cases of SCD occur in persons in apparent good health, with no prior evidence of heart disease and out of hospital. Sudden cardiac death is often the first manifestation of coronary heart disease^{1,9}.

Autopsy studies in unselected objects reveals that about one third of sudden deaths have non cardiac causes, for e.g. intracranial hemorrhage, pulmonary embolism, acute severe asthma ...etc^{10, 11}.

Although, like other parts of the world, the sudden cardiac death is considered an important and challenging health problem in Mosul city of Iraq, we lack a clear data about the distribution and frequency of SCD, and the mode and severity of coronary atherosclerotic lesions

The aims of this study are to find the incidence of SCD in Nineveh city among people older than 15 year, to know the pattern of autopsy study and the underlying cardiac diseases in those who Were diagnosed as SCD, and finally to study the role of atherosclerotic coronary heart disease in SCD in regard to the severity of lesion, number and type of vessels involved and the signs of myocardial ischemia in different age groups and genders.

PATIENTS AND METHODS:

Study design

This is a retrospective, case series study. From 1st of Jan. 2010 to 31st Dec. 2011

Data collection

Over 2 years (2010 and 2011), the records of pathology study of the medico-legal autopsies performed on cases of sudden unexpected death at the mortuary of the

Nineveh Forensic Medicine Institute in Nineveh city of Iraq were collected. This is the only forensic medicine institute in Nineveh, which drains all the medico-legal deaths and the sudden un-explained death from this region.

The Institute of Forensic Medicine in Nineveh depends on the WHO's 24-hour based definition of sudden death^{1,2,3,12} i.e. the decedent should have last been seen alive and in stable condition 24h or less before being found dead, ruling out all potentially lethal non- cardiac causes.

After exclusion of other causes of sudden natural death, the total number of cases above 15 year that fulfill the definition of sudden cardiac death in Nineveh during 2 years (2010-2011) was 584. The population number in this area in 2011 was 1656987

Autopsy histopathology study

The autopsy and histo-pathological reports of 99 sudden cardiac death cases above 15 years were reviewed, including cases with abnormal cardiac pathology or normal autopsy study.

The autopsy pathology study was conducted in the histopathology department in Al- Jamhory hospital in Mosul by pathologists. The reports in general were divided into: 1. Gross pathology, including weight of the heart, chambers size, septal thickness, and valves. 2. Microscopic picture of coronaries and myocardium.

The coronary arteries were examined along their length by transverse cuts, and the lesions of atherosclerosis were visually graded as:

1. Mild: thickening of vessel wall with 25-50% lumen narrowing
2. Moderate: thickening of vessel wall with 50-75% narrowing

3. Severe: thickening and calcification with more than 75% lumen narrowing.

(According to scoring system used by Humphries et al which include the major coronary arteries and determine the severity of CAD by measuring narrowing^{5,6,13})

The diagnosis of recent ischemia i.e. acute myocardial infarction (MI) demonstrated by the presence of coagulation necrosis of myocytes with or without inflammatory infiltrate^{13, 14}. Healed MI was diagnosed by focal macroscopic replacement of the myocardium by scarring, with histological confirmation. Myocardial hypertrophy was defined as increase heart weight for the body surface area and/or more than 15 mm thickness of compact left ventricle myocardium¹³.

The cases of SCD were divided into three groups; the atherosclerotic coronary heart disease, the non-coronary cardiac disease and the normal autopsy group.

Statistical analysis:

Data analysis was carried out by means of Minitab statistical software (version 13). Chi-square test was used. P value less than 0.05 was considered statistically significant.

RESULTS:

Result description

The total number of cases above 15- year that fulfill the definition of SCD in Nineveh during 2 years was 584, average is 292 per year. The population of Nineveh city above 15 year of age in 2011 was 1656987.

The incidence of SCD in Nineveh among people older than 15 year in one year is 17.6 in 100 000 population.

The autopsy and histo-pathological reports of 99 sudden cardiac death cases, including abnormal cardiac pathology or normal autopsy

study, were reviewed. The age was 15–75 year, mean age is 40 year. Sixty two (63%) were less than 40. Male: female ratio 9:1.

Table 1, Figure 2

Coronary heart disease (CHD) attributed to 57 (57.5%) of SCD cases, and it is the cause of SCD in (84%) of cases aged above 40y compared to (42%) less than 40y **Table 1, figure 1**

Twenty four cases (24%) of SCD show non-atheromatous cardiac pathology, 20 (83%) were less than 40y. They cause (32%) of SCD before 40y compared to (11%) above 40y. The LVH was the most frequent finding (10%), valve disease (4%), and cardiomegaly without LVH (3%). The other causes listed in **table 3, figure 3**

Normal autopsy was found in (18%) of SCD, 16 (88%) were less than 40y, which constitute (25%) of SCD below 40y compared to (6%) above 40y.

The frequency of distribution of causes of SCD is significantly different before and after 40 y. ($p= 0.000$), although the atherosclerotic coronary diseases is the most common cause of SCD in both age groups. **Table 1, figure 1**

There is a significant difference in the causes of SCD between males and females ($p=0.003$). The non-atheromatous SCD is the most frequent cause (80%) in females, while in male the coronary heart disease is the most important cause (63%). **Table 2, figure 2**

In CHD, the atherosclerotic changes were severe in (49%) of cases, moderate in (37%) and mild in (14%). **Table 4, figure 4**. There is no difference in severity between the age

groups ($p=0.414$).

The atherosclerotic changes involve three vessels in 36 (63%) of cases, two vessels were involved in 12(21%) of cases and 9(16%) of cases show one vessel disease. There is no significant difference between age groups regarding number of vessels ($p=0.713$). The severe lesion was more frequent 21(58%) in cases with three vessels disease, moderately atherosclerotic lesion was the most frequent pattern 7(58%) in two vessel disease. **Table 5, figure 5**

In coronary heart disease, the vessels were involved in the following frequencies: left anterior ascending (LAD) artery was involved in 44(35%) cases, followed by right coronary artery (RCA), 40(32%) cases and left coronary artery (LCA) in 35(28%) cases. The left circumflex (CX) has least affection, 4 (3%). There was no difference in type of vessel involved between cases aged above and below 40 year ($p=0.704$). There was significant difference between the severity of lesion and type of vessel affected ($p=0.032$). Moderate and severe lesion was frequently found in LAD, LCA more frequently shows moderate changes, no significant difference was found in severity of lesion in RCA. **Table 6, figure 6**.

Thirty nine percent of cases showed myocardial ischemia; 4 (7%) new ischemic changes, 18(32%) old ischemic changes), 35(61%) cases had no changes in myocardium. There is no difference in the appearance of ischemic changes between the two age groups ($P\text{-Value} = 0.954$). **Table 7, figure 7**.

TABLES AND FIGURES

Table 1: Causes and age distribution of sudden cardiac death.

CAUSES OF SCD n=99	< 40 Years n = 62 (63%)	≥ 40 Years n = 37 (37%)	P-value*
Coronary 57(57.5%)	26 (42%)	31 (84%)	0.000
Non coronary 24(24%)	20 (32%)	4 (11%)	
Normal autopsy 18(18%)	16 (26%)	2 (5%)	

*Chi-square test was used.

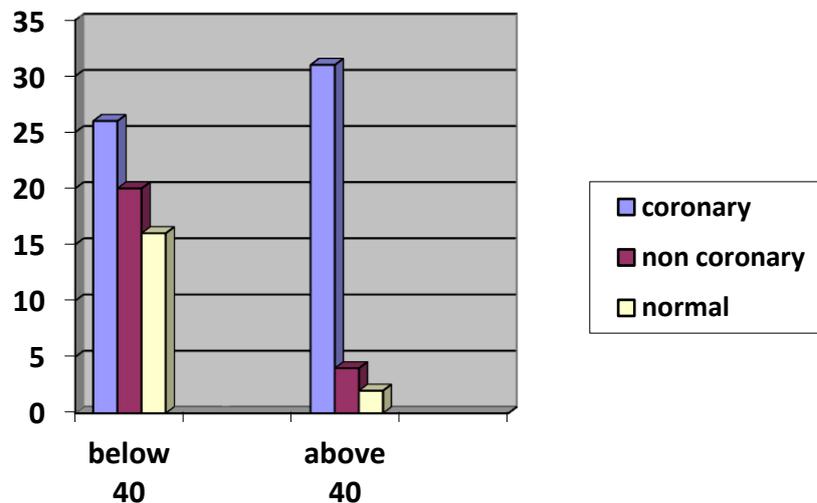


Figure 1 Causes and age distribution of sudden cardiac death.

Coronary heart disease (CHD) attributed to 57 (57.5%) of SCD cases, and it is the cause of SCD in (84%) of cases aged above 40y compared to (42%) less than 40y

Table 2: gender distribution of sudden cardiac death

CAUSES OF SCD n=99	MALE n = 89 (90%)	FAMALE n = 10 (10%)	P-value*
Coronary 57(57.5%)	56 (63%)	1 (10%)	0.003
Non coronary 24(24%)	20 (22%)	4 (40%)	
Normal autopsy 18(18%)	13 (15%)	5 (50%)	

*Chi-square test was used.

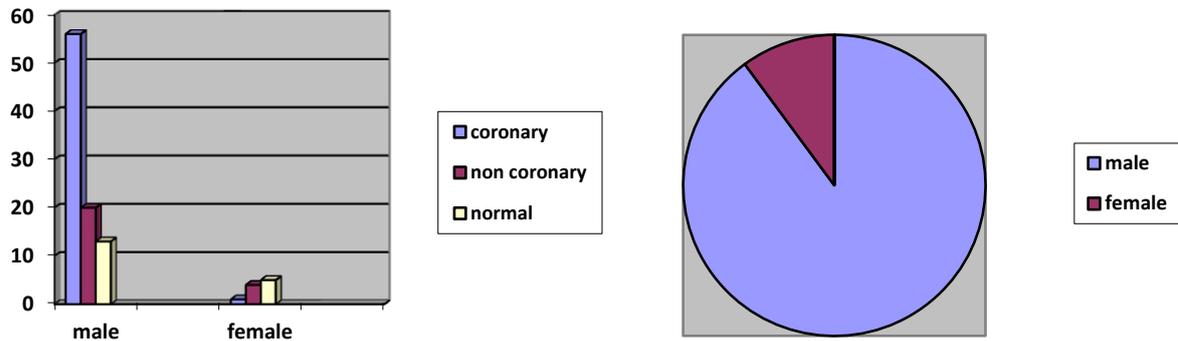
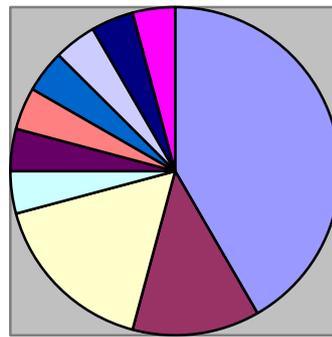


Figure 2

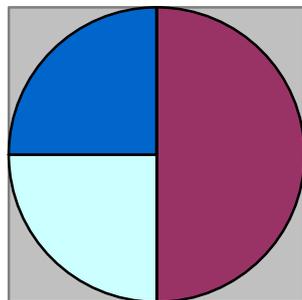
Male: female ratio 9:1. In males the CAD is the most important cause of SCD, while in female the non-atheromatous causes are most common

Table 3: Pathological causes for non-coronary sudden cardiac death.

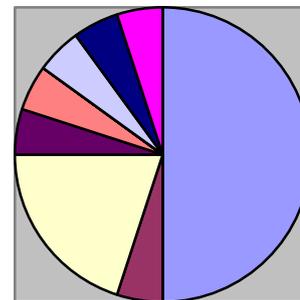
CAUSES	< 40 YEAR No.20 (83%)	≥40 YEAR No.4 (17%)	TOTAL No.24 (%)	All cardiac cases No.99(%)
LVH	10	—	10(42%)	(10.1 %)
Cardiomegaly (CMG) (no LVH)	1	2	3(13%)	(3 %)
Valve disease (VD)	4	—	4(17%)	(4 %)
Ventricular Aneurysm (V Aneurys)	—	1	1(4%)	(1%)
Aortic aneurysm (A Aneurys)	1	—	1(4%)	(1%)
Aortic thrombus	1	—	1(4%)	(1 %)
Tricuspid thrombus (TR Thrombus)	—	1	1(4%)	(1 %)
Myocarditis	1	—	1(4%)	(1 %)
Apical hemorrhage (Apical HMG)	1	—	1(4%)	(1 %)
LV hydatid cyst (LV HC)	1	—	1(4%)	(1 %)



- LVH
- CMG
- VD
- V ANEURYS
- A ANEURYS
- AORTIC THROMBUS
- TR THROMBUS
- MYOCARDITIS
- APICAL HMG
- LV HC



>40 Y



< 40 Y

Figure 3 Pathological causes for non-coronary sudden cardiac death.

Table 4: the degree of severity of atherosclerotic lesion in coronary SCD

Severity	<40 years	> 40 years	P-value*	Total (%)
MILD	2	6	0.414	8 (14%)
MODERATE	11	10		21(37%)
SEVERE	13	15		28(49%)
	26	31		57

* Chi-square test was used

The atherosclerotic changes were severe in (49%) of cases, moderate in (37%) and mild in (14%). There is no difference in severity between the age groups (p=0.414).

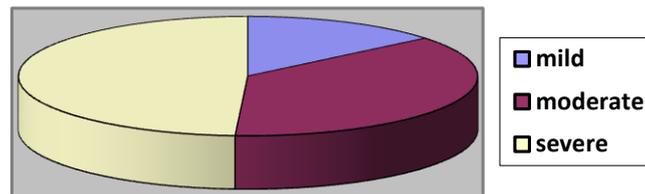


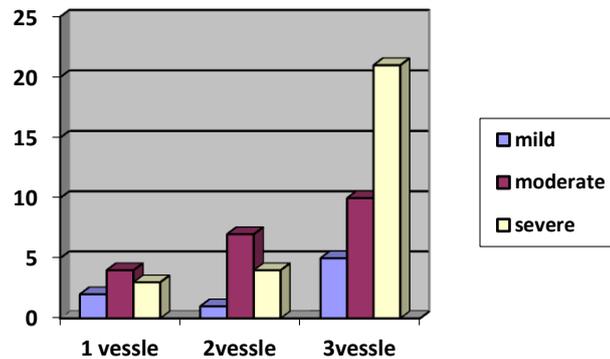
Figure 4: degree of severity of atherosclerotic lesion in coronary SCD

Table 5: Coronary heart disease numbers of vessels and severity of lesion

No. of vessels affected	Severity	< 40 Years	≥ 40 ^a Years	Total n = 57
One vessel	MILD	0	2	2
	MODERATE	3	1	4
	SEVERE	2	1	3
Total		5	4	9 (16%)
Two vessels	MILD	0	1	1
	MODERATE	5	2	7
	SEVERE	1	3	4
Total		6	6	12 (21%)
Three vessels	MILD	2	3	5
	MODERATE	3	7	10
	SEVERE	10	11	21
Total		15	21	36 (63%)

^b Chi-square test was used comparing the severity of lesion within each group of no of vessels. **P=304**

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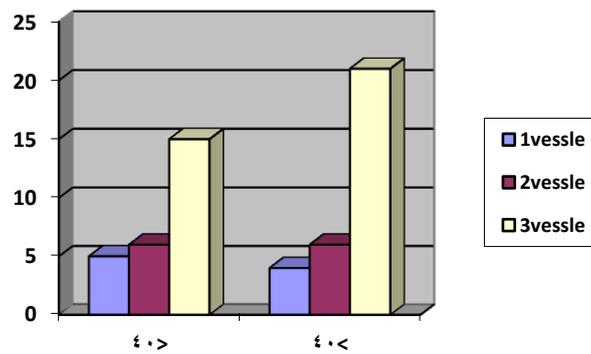


Figure 5

*The severe lesion was more frequent (58%) in cases with three vessels disease, moderately atherosclerotic lesion was the most frequent pattern (58%) in two vessel disease

**No significant difference was found between no. of vessels affected and the age groups, Chi-square test was used, $p = 0.713$.

Table6: Coronary heart disease vessels involved and severity of lesion

Site of vessels	Severity	<40 years	> 40 ^b years	Total ^a n = 123
LAD	MILD	0	3	3
	MODERATE	9	11	20
	SEVERE	12	9	21
Total		21	23	44 (35%)
RCA	MILD	6	5	11
	MODERATE	7	11	18
	SEVERE	3	8	11
Total		16	24	40 (32%)
LCA	MILD	2	2	4
	MODERATE	8	13	21
	SEVERE	3	7	10
Total		13	22	35(28%)

Site of vessels	Severity	<40 years	> 40 ^b years	Total ^a n = 123
CX	MILD	1	1	2
	MODERATE	1	0	1
	SEVERE	1	0	1
Total		3	1	4(3%)

^a Significant difference was found between the severity of lesion and the site of vessels affected, Chi-square test was used, **P = 0.032**. CX not included in the analysis because of small sample (n = 4).

^b Chi-square test was used to compare type of vessel affected in both age groups, **p=0.704**.

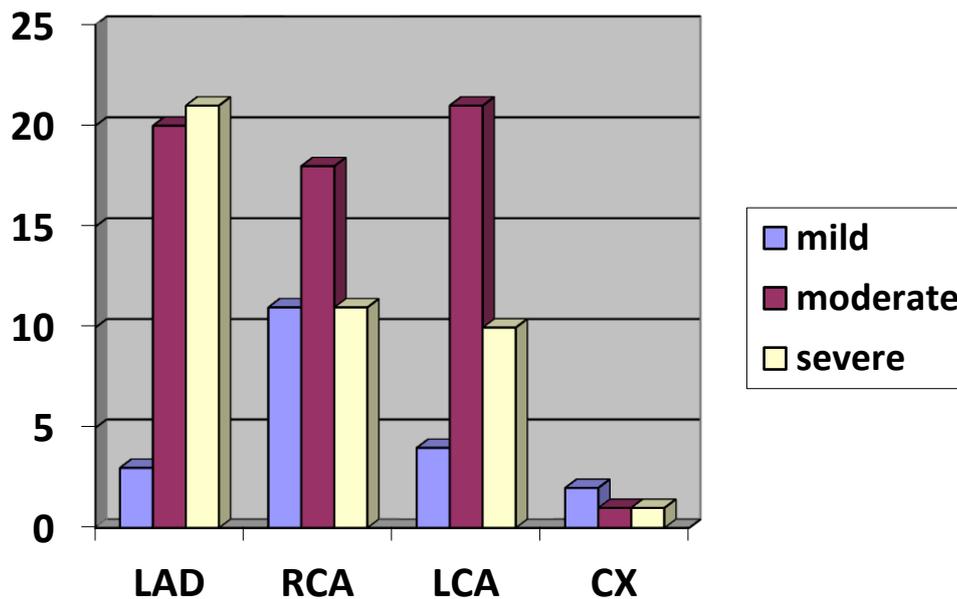


Figure 6: Coronary heart disease vessels involved and severity of lesion

Significant difference was found between the severity of lesion and the site of vessels affected Moderate and severe lesion was frequently found in LAD, LCA more frequently shows moderate changes, no significant difference was found in severity of lesion in RCA

Table 7: the ischemic changes in the myocardium.

Ischemic changes	< 40 years	≥ 40 years	Total n = 57
Old ischemic changes	8	10	18 (31.6%)
New ischemic changes	2	2	4 (7.0%)
No ischemic changes	17	18	35 (61.4%)

Chi-square test was used comparing ischemic lesion in both age groups

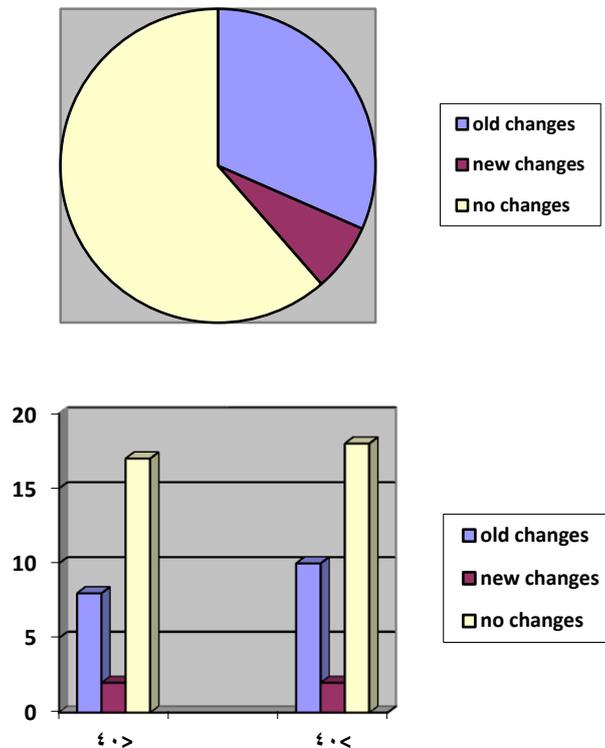


Figure 7: Ischemic changes in the myocardium.

There is no difference in the appearance of ischemic changes between the two age groups
P-Value = 0.954

DISCUSSION:

The sudden cardiac death showed variable reported incidence, which is related to the difference in classifying the death mode and time and to the study population. The incidence of SCD increases from less than (10 per 100 000) person/years in healthy young individuals, to over (50 per 100 000) person/years in patients with structural heart disease, and it is greater in males compared to females^{10,15-17}. Reports from Asia on sudden death estimated an annual incidence of 145 per 100 000 in people over 15 years¹⁰. The European Society of Cardiology has adopted the incidence ranges from 36-128 per 100 000 population per year¹⁸⁻²⁰. In our study the incidence of SCD in Nineveh city is 18 per

100 000 population per year, this might be underestimated because some SCD cases may occur and be reported in coronary care and casualty units not send to forensic medicine department.

The mean age of the studied sample is 40 year. The higher percentage of those less than 40 year (64%) is due to the tradition of the forensic medicine department in this area; to autopsy the younger persons with un explained sudden death, as usually the older persons had medical reports indicate their cardiac diseases, so they might not have the autopsy study.

There was significant increase in SCD in males compared with females which was shown in all previous studies^{1, 5, 10, 15}.

In our study, coronary atherosclerosis is the

most common cause of SCD (58%). These findings are consistent with most of previous studies^{5, 12,18,21,22}. In the United States last statistics indicate that 80% of SCD cases are secondary to CAD². In clinico-pathological study of sudden death by Kasthuri et al, in India, 77% individuals died of CAD^{5, 21}. Similar observations were made in "an autopsy study of SCD" in Rawalpindi where (79%) cases showed various grades of atherosclerosis⁵. Whereas coronary artery diseases are the most common cause of SCD in Caucasians and Asians, the situation appears different from blacks and Africans and the Caribbeans^{1, 23}. Ischemic heart disease has been reported to be rare in most African communities^{1, 24}, where hypertension is the most common cardiovascular disease. O Rotimi et al study "sudden cardiac death in Nigerians" found that hypertensive heart disease was the cause of death in (83.5%), while IHD was the cause of death in (6.3%) only¹.

In the current study However, (24%) of SCD are of non –atheromatous structural cardiac diseases. This percentage is comparable the autopsy study of SCD in Rawalpindi³, where (21%) of cases show non atheromatous cardiac causes, and other studies which report (10-20%) of cases²⁵, data from forensic medical examiner in the US indicate that (38%) are secondary to non – coronary cardiac disease².

The most common cause of the non atheromatous SCD is left ventricular hypertrophy which represents (10 %) of the total SCD cases, which is comparable with the Rawalpindi study³ (8%), and the Indian study²¹ (7.6%) and two other previous studies the McKenna et al²⁶ and Nicod et al²⁷. In this study, both ventricular hypertrophy and myocardial dilatation constitute (13%), which

is close to the US statistics which indicate that 10-15% of SCD is secondary to cardiomyopathy (dilated and hypertrophic)².

Eighty three percent of patients with non atheromatous SCD are less than 40 year. This is similar to data presented by Morentin et al (75%)⁴.

In this study 18 cases (18%) shows completely normal autopsy, which is comparable with two previous studies where it was (11.8%) and (16.3%)²⁸. In the absence of coronary artery atherosclerosis myocardial ischemia can be caused by coronary spasm secondary to overdriven adrenergic activity^{5, 30, 31}, this is because the myocardium is exposed to both ischemia and reperfusion insults and occasionally associated with VT, VF, or SCD³¹. Contraction of an over bridging left ventricular muscle during systole can compress a major epicardial artery causing occlusion of such artery and may precipitate death in some subjects especially during exercise^{5,30}. There was no examination of conduction system in our pathology examination, which was seen in other studies. Sudden arrhythmic death which found predominantly in young males², may also be a cause in cases with normal autopsy, these cases are usually inherited arrhythmia syndromes. Eighty eight percent of cases with normal autopsy were less than 40 year.

The major work in this paper is the analysis of the coronary atherosclerotic changes seen in SCD. The atheromatous SCD constitute (57.5%) of the total studied sample. Triple vessel disease was the predominant finding (63%), followed by 2 vessels disease (21%), and single vessel involved in (16%). The severe lesion was the predominant pattern (50%). These results are consistent with previous studies^{2, 4, 5, 13, and 21}.

In this study the severity of lesion found to be correlated to the number of vessels involved.

The most frequently involved vessel is the LAD, which mainly shows severe lesions, followed by the RCA which equally shows mild to severe lesion, then the LCA which shows mainly moderate and severe lesions. This is similar to what was reported previously^{32, 33}.

Other causes of CAD, including dissection, embolism and vasculitis can cause sudden death³⁴, has not been found in our study. Also, we couldn't report anomalous coronary arteries origin or course variation, which is attributed to rare incidence of SCD in athletics³⁴.

Myocardium was normal in (61%) of cases. Old infarcts found in (32%) of cases. This percentage correlates with other studies in which healed infarcts has been reported in (35-40%) of cases^{5, 25}. New ischemic changes of recent infarcts seen in (7%) of cases, which is lower than previous studies that show recent infarcts in (20- 25%) of cases^{5, 25}. The study conducted in Hennepin County (Minnesota)¹³, shows old ischemic lesion in 34%, 27% had acute ischemic lesion. At autopsy it is difficult to diagnose acute myocardial infarction if the person had sudden death because the first grossly visible changes in the myocardium indicative of acute MI are seen after about 12-24h survival after the event, where there will be oedema of the myofibrils and pallor, the surface looking dull and granular³³.

Over the past 55 years there was a

significant decline in the rates of SCD, paralleling the cardiovascular mortality reduction accompanies the advances in the diagnosis, management and prevention of CAD, but only marginal reductions have been seen in younger age groups^{34,35}.

The true incidence of SCD is unknown. Over 90% of SCD occur out of hospital, non forensic autopsies are usually not performed³⁶.

CONCLUSION:

The incidence of SCD in Mosul is under estimated (18 per 100 000 population per year), and is less than reported worldwide. In males the CAD is the most important cause of SCD in all cases and it is the major cause of death above 40 years, while in female the non-atheromatous causes are most common. One fourth of cases of SCD are due to non-atheromatous cardiac pathology, most of them are less than 40 years, and the most common was LVH with or without cardiomegaly, followed by valvular heart diseases. Small number of cases have normal autopsy most are less than 40 years.

Eighty percent of CAD have moderate to severe atherosclerotic lesions and involving more than two vessels, the severity of lesions was correlated with number of vessels involved. The coronary vessels were involved in close percentage, the LAD is most severely affected then the LCA which mostly shows moderate lesion. The myocardium is normal in most of cases of CAD, one third have old ischemic changes, recent changes of infarction present in only 4% of cases.

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الموت القلبي المفاجئ في محافظة نينوى (العراق) خلال عامي (2010 و2011) دراسة استيعادية بعد الوفاة

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الملخص

خلفية البحث: تُعد مشكلة الموت القلبي المفاجئ من التحديات الطبية المهمة، و يعرف على أنه الوفاة التي تحدث خلال 24 ساعة من التغيير المفاجئ للوضع السريري السابق للمتوفى، وبعد استبعاد جميع الأسباب غير القلبية المحتملة للوفاة. وإن تباين نسب حالات الموت القلبي المفاجئ واختلاف أسبابها وعدم وجود بيانات في منطقتنا، حفزنا على إجراء هذه الدراسة.

الأهداف: بيان معدل حدوث حالات الموت القلبي المفاجئ في مدينة نينوى، ومعرفة أسبابها، ودراسة أمراض القلب التاجية فيما يتعلق بشدة التصلب العصيدي للشرايين، وعدد ونوع الأوعية المصابة وعلامات نقص التروية لعضلة القلب في مختلف الفئات العمرية و لكلا الجنسين.

طريقة البحث: بلغ العدد الإجمالي لحالات الموت القلبي المفاجئ فوق 15 سنة في نينوى (584) حالة خلال عامين، وتم تحليل نتائج تشريح الجثة وتقارير الفحص النسيجي لـ 99 حالة، تم تصنيف آفات تصلب الشرايين العصيدي على أنها خفيفة ومتوسطة وشديدة. اجري التحليل الإحصائي للبيانات باستعمال اختبار مربع كاي.

النتائج: بلغ معدل حدوث الموت القلبي المفاجئ في نينوى 17.6 في 100000. تتراوح أعمارهم بين (15-75) سنة، (64٪) أعمارهم أقل من 40 سنة. نسبة الذكور: الإناث (1:9). سببت أمراض القلب التاجية (58٪) من الحالات، أمراض القلب غير العصيدية (24٪)، وكان تشريح الجثة طبيعي في (18٪). تختلف أسباب الموت القلبي المفاجئ قبل وبعد عمر 40 سنة (0.000 = p)، (83٪) من حالات أمراض القلب التاجية تزيد أعمارهم عن 40 سنة، في حين (83، 88٪) من أمراض القلب غير العصيدية وتشريح القلب الطبيعي كانت أقل من 40 سنة. وكان التصلب العصيدي شديد في (49٪). ومتوسط في (37٪). ارتبطت شدة الآفة بعدد الأوعية المصابة. وكان الشريان الأمامي النازل الأيسر مصابا بشكل متكرر وشديد. (7٪) فقط ظهر لديهم آثار نقص تروية حديثة لعضلة القلب، نقص تروية قديمة وجدت في (32٪). لم يكن هناك فرق في شدة الإصابة، وعدد ونوع الأوعية المصابة، ولا في نقص تروية عضلة القلب بين الفئات العمرية.

الاستنتاج: مرض الشريان التاجي هو السبب الأكثر أهمية للموت القلبي المفاجئ في الذكور من جميع الأعمار، وهو السبب الرئيسي للوفاة فوق عمر الأربعين، وهذا يماثل الدراسات السابقة لدى القوقازيين والآسيويين. وكانت الإصابة بتصلب عصيدي متوسطة وشديدة في (80٪) من الحالات ولا توجد آثار نقص تروية عضلة القلب في معظم الحالات.

الكلمات الدالة: الموت القلبي، نينوى، الأوعية التاجية، التصلب العصيدي، تشريح الجثة، الفحص النسيجي، نقص التروية لعضلة القلب.

