P-ISSN: 2617-9806
E-ISSN: 2617-9814

Impact Factor: RJIF 5.2
www.nursingjournal.net

International Journal of Advance Research in Nursing

Volume 5; Issue 2; Jul-Dec 2022; Page No. 171-180

Received: 07-05-2022
Accepted: 12-06-2022

Indexed Journal
Peer Reviewed Journal

Cardiovascular events and their outcome in diabetes and in people with prediabetes in the Coronary Unit of a Secondary General Hospital

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DOI: https://doi.org/10.33545/nursing.2022.v5.i2.C.283

Abstract

Background: The epidemic proportions that obesity, Diabetes Mellitus, as well as the progressive increase in the average life expectancy and consequently demographic aging are the main factors in the increase in the prevalence of Cardiovascular Diseases. Special reference is made to patients with prediabetes which usually works subclinical without obvious clinical symptoms.

Purpose-Methodology-Materials: This is a retrospective study of patients who were admitted with cardiovascular events to the Coronary Unit of a Secondary General Hospital in Greece over a period of three months. A convenience sample of 178 patients (mean age: 67, 7), who were admitted to the Coronary Unit participated in the study. The criteria for the diagnosis of cardiovascular events were based on the guidelines of the European Society of Cardiology.

Results: The findings are mostly in line with the literature, according to which the cardiovascular events in diabetics, as well as in people with Prediabetes , as the reason for admission of these people to the Coronary Unit, was Acute Myocardial Infarction in men at a rate of 19.5% , Acute Coronary Syndrome in 15.4% and Atrial Fibrillation in 13.8%, while in women the percentage of Acute Myocardial Infarction was 12.7%, of Acute Coronary Syndrome 10.9%, in contrast to Atrial Fibrillation it touched 23.8% and of Acute Pulmonary Oedema 20.0%. In relation to age, the highest percentage of Acute Myocardial Infarction was in the grouped age of 50-59 years, of Acute Coronary Syndrome at the age of 60-69 years, while of Atrial Fibrillation at the age of 70-79 years and at the same age the highest percentage of Acute Pulmonary Oedema. Regarding the outcome in days of hospitalization, the largest percentage of patients, similar in both sexes, was hospitalized for two days in the Coronary Unit with the largest percentage being transferred to the Cardiology Clinic for the continuation of the treatment process and a large percentage, which touched the 41.8% in total in both sexes, was transferred to an interventional center for further treatment. Death as an outcome was more common in women than in men.

Conclusions: People with Diabetes Mellitus have a three to five times greater risk of developing Coronary Heart Disease, even when other risk factors have been treated. It turns out that in addition to the well-known correlation between Diabetes Mellitus and Coronary Artery Disease, prediabetes, which acts subclinically, it is positively correlated with the occurrence of Coronary Artery Disease in patients who are hospitalized in a Coronary Unit. The productive age (50-59 years) is the age group with the highest percentage of Acute Myocardial Infarction, while the elderly (70-79 years) for Atrial Fibrillation. About half of the patients with Acute Myocardial Infarction are further treated with either coronary artery bypass grafting or coronary artery bypass grafting, while the prognosis was worse in women than in men. Early detection of diabetic and pre- diabetic patients and their effective treatment by medical and nursing staff, adherence to monitoring protocols for diabetic patients, a holistic and interdisciplinary approach with the participation of other health professionals, dietitians, and nutritionists are deemed necessary. Education, reinforcement and empowerment for behavior modification, self-care enhancement, as well as strengthening the cooperation of cardiologists and diabetologists in order to reduce cardiovascular events and their complications in the population.

Keywords: Cardiovascular diseases, cardiovascular events, coronary unit, diabetes mellitus, prediabetes, self-care

Introduction

Obesity and Diabetes Mellitus constitute the modern global pandemic, which is in full swing, with approximately 50% of people suffering from Diabetes Mellitus unaware of it (IDF, 2012, Tuomilento *et al*., 2001) [32]. Every 10 seconds 3 people develop Diabetes Mellitus and at the same time another 2 people remain undiagnosed (WHO, 2012, Malik *et al*., 2012) [21], 4 – 7 years elapse from the onset to the diagnosis of Diabetes Mellitus (Harris *et al*. 1992, Wood *et al*., 2001) [35], apart from the social parameters of the disease there is an important parameter, the economic one, as Diabetes Mellitus is an expensive disease (Wang *et al*. 2011) [33]. The annual cost of diabetes mellitus in the USA is $174 billion (about 15% of the National Health Cost). The direct cost of diabetes, complications and medical care, is $116 billion, while the indirect cost of the condition, disability and premature mortality, is $58 billion (Wang *et al*. 2011) [33]. In Greece, the direct annual cost (regardless of the level of regulation) for each patient with Type 2 Diabetes Mellitus is 1.300 Euros (ESDY, 2012).

Patients with Diabetes Mellitus are prone to multiple and complex complications. These complications include both cardiovascular disease (heart disease, it is estimated that 80% of deaths in people with Diabetes Mellitus are attributable to Cardiovascular Disease, Vascular Stroke and Peripheral Vascular Disease) and Microvascular Disease

(Retinopathy, Neuropathy and Microalbuminuria) (Aronson *et al*., 1997, Athyros *et al*., 2004, Bodiga *et al*., 2014, Trachanas *et al*., 2014) [7, 9, 31]. Diabetes Mellitus accelerates the progression of the atherosclerotic process affecting negatively both the outcome of the hospitalization of patients with Diabetes Mellitus in terms of mortality the frequency of various complications and ultimately the duration and cost of hospitalization (Pitsavos *et al*., 2003, Sarker *et al*., 2009, Trainsdothir *et al*., 2005) [27, 28, 30]. Epidemiological data of the last 5 years have proven that complications in Diabetes Mellitus begin early in the "journey" from normal glucose tolerance to the onset of Diabetes Mellitus. There is an interval in the glycemic state between normal glucose tolerance and Diabetes Mellitus, the values of which are not "innocent", but are the harbinger of Diabetes Mellitus and its complications. The recognition of risk factors, which can be proven to affect the outcome of Cardiovascular Diseases in patients with Diabetes Mellitus has contributed to the formation of international guidelines. Early diagnosis and treatment increases the chances of preventing dangerous and costly complications (IDF, 2012, Melidonis, 2011) [23].

2. Purpose - Methodology - Study Population - Statistical analysis

This is a retrospective study of patients who were admitted with cardiovascular events to the Coronary Unit of a Secondary General Hospital in Greece. A convenience sample of 178 patients was admitted to the Coronary Unit participating in the study, data collection performed during a 3-month period (March to May 2019). Demographic characteristics included age and gender. The criteria for the diagnosis of cardiovascular events were based on the guidelines of the European Society of Cardiology.

Control of Electrocardiogram, Ultrasound-Cardiogram, as well as biochemical control for mobilization of myocardial enzymes, indicative of myocardial ischemia, as well as control of blood sugar to find newly diagnosed diabetic and pre-diabetic patients and finally, the Outcome of Cardiovascular Events in these patients was studied. The diagnosis of Diabetes Mellitus was based on the patient's medical record and self-reported history.

A descriptive statistical analysis was performed. Continuous variable (e.g. age) were presented as means and standard deviations. Categorical variables were presented as frequencies and percentages. Patient clinical and demographic characteristics were analyzed. The age patients were analyzed in correlation with cardiovascular events using the chi-square test. Data analysis was performed using the software SPSS version 22.

3. Results

Table 1: Demographic characteristics

Sex					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Man	123	69.1	69.1	69.1
	Woman	55	30.9	30.9	100.0
	Total	178	100.0	100.0	

Table 2: Age

Age grouped					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	40-49	18	10.1	10.3	10.3
	50-59	32	18.0	18.4	28.7
	60-69	39	21.9	22.4	51.1
	70-79	53	29.8	30.5	81.6
	80-89	32	18.0	18.4	100.0
	Total	174	97.8	100.0	
Missing	System	4	2.2		
Total		178	100.0		

Table 3: Men's Age

Age					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	42	1	,8	,8	,8
	43	3	2.4	2.4	3.3
	45	3	2.4	2.4	5.7
	46	3	2.4	2.4	8.1
	47	1	,8	,8	8,9
	48	2	1.6	1.6	10.6
	49	3	2.4	2.4	13.0
	50	1	,8	,8	13.8
	51	2	1.6	1.6	15.4
	52	4	3.3	3.3	18.7
	55	3	2.4	2.4	21.1
	57	3	2.4	2.4	23.6
	58	8	6.5	6.5	30.1

	59	3	2.4	2.4	32.5
	60	5	4.1	4.1	36.6
	61	1	,8	,8	37.4
	62	4	3.3	3.3	40.7
	63	3	2.4	2.4	43.1
	64	1	,8	,8	43.9
	65	4	3.3	3.3	47.2
	66	4	3.3	3.3	50.4
	69	8	6.5	6.5	56.9
	70	2	1.6	1.6	58.5
	72	4	3.3	3.3	61.8
	73	2	1.6	1.6	63.4
	74	5	4.1	4.1	67.5
	75	5	4.1	4.1	71.5
	76	4	3.3	3.3	74.8
	77	3	2.4	2.4	77.2
	78	5	4.1	4.1	81.3
	79	4	3.3	3.3	84.6
	80	3	2.4	2.4	87.0
	81	4	3.3	3.3	90.2
	82	3	2.4	2.4	92.7
	83	1	,8	,8	93.5
	84	2	1.6	1.6	95.1
	85	2	1.6	1.6	96.7
	87	3	2.4	2.4	99.2
	88	1	,8	,8	100.0
	Total	123	100.0	100.0	

Table 4: Age of Women

Age					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	44	1	1.8	2.0	2.0
	46	1	1.8	2.0	3.9
	54	2	3.6	3.9	7,8
	56	1	1.8	2.0	9.8
	58	3	5.5	5.9	15.7
	59	2	3.6	3.9	19.6
	60	1	1.8	2.0	21.6
	61	2	3.6	3.9	25.5
	62	1	1.8	2.0	27.5
	66	4	7.3	7,8	35.3
	68	1	1.8	2.0	37.3
	70	2	3.6	3.9	41.2
	71	3	5.5	5.9	47.1
	72	3	5.5	5.9	52.9
	73	1	1.8	2.0	54.9
	75	4	7.3	7,8	62.7
	76	1	1.8	2.0	64.7
	77	1	1.8	2.0	66.7
	78	2	3.6	3.9	70.6
	79	2	3.6	3.9	74.5
	80	3	5.5	5.9	80.4
	81	1	1.8	2.0	82.4
	82	1	1.8	2.0	84.3
	85	1	1.8	2.0	86.3
	86	5	9.1	9.8	96.1
	87	1	1.8	2.0	98.0
	88	1	1.8	2.0	100.0
	Total	51	92.7	100.0	
Missing	System	4	7.3		
Total		55	100.0		

Cardiovascular event by GENDER as a reason for admission to the Coronary Unit

Table 5: Cardiovascular Events by Sex

			Angina-Rapid Atrial Fibrillation	Paroxysmal Atrial Fibrillation	Heart Failure– Acute Pulmonary Edema	Acute Myocardial Infarction - Silent Ischemia	Acute myocardial infarction	Heart Failure– Rapid Atrial Fibrillation
Sex	Man	Count	2	2	4	1	24	1
		% within Gender	1.6%	1.6%	3.3%	.8%	19.5%	.8%
	Woman	Count	0	2	2	1	7	0
		% within Gender	0.0%	3.6%	3.6%	1.8%	12.7%	0.0%
Total		Count	2	4	6	2	31	1
		% within Gender	1.1%	2.2%	3.4%	1.1%	17.4%	.6%

Table 6: Cardiovascular Events by SEX

			Acute Coronary Syndrome	Acute Pulmonary Edema– Acute Myocardial Infarction	Atrial Fibrillation	Unstable Angina	Angina pectoris	Acute Pulmonary Edema– Rapid Atrial Fibrillation
Sex	Man	Count	19	2	17	6	6	0
		% within Gender	15.4%	1.6%	13.8%	4.9%	4.9%	0.0%
	Woman	Count	6	0	13	0	4	1
		% within Gender	10.9%	0.0%	23.6%	0.0%	7.3%	1.8%
Total		Count	25	2	30	6	10	1
		% within Gender	14.0%	1.1%	16.9%	3.4%	5.6%	.6%

Table 7: Cardiovascular Events by SEX

			Angina- Atrial Fibrillation	Chest pain	Angina Fatigue	Multiple Cardiovascular Unit Readmissions	Coronary Heart Disease– Acute Pulmonary Edema	Onset Pulmonary Edema- Dyspnea
Sex	Man	Count	1	11	1	3	1	0
		% within Gender	.8%	8.9%	.8%	2.4%	.8%	0.0%
	Woman	Count	0	6	0	1	0	1
		% within Gender	0.0%	10.9%	0.0%	1.8%	0.0%	1.8%
Total		Count	1	17	1	4	1	1
		% within Gender	.6%	9.6%	.6%	2.2%	.6%	.6%

Table 8: Cardiovascular Events by SEX

			Non-Stemi	Sudden shortness of breath	Posterior sternal pain	Precardial pain	Total
Sex	Man	Count	3	3	1	1	123
		% within Gender	2.4%	2.4%	.8%	.8%	100.0%
	Woman	Count	0	0	0	0	55
		% within Gender	0.0%	0.0%	0.0%	0.0%	100.0%
Total		Count	3	3	1	1	178
		% within Gender	1.7%	1.7%	.6%	.6%	100.0%

Table 9: Cardiovascular Events as a whole

Cardiovascular Event - Admission Diagnosis					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Angina – Rapid Atrial Fibrillation	2	1.1	1.1	1.1
	Paroxysmal Atrial Fibrillation	4	2.2	2.2	3.4
	Heart Failure – Acute Pulmonary Edema	6	3.4	3.4	6,7
	Acute Myocardial Infarction -Silent Ischemia	2	1.1	1.1	7.9
	Acute myocardial infarction	31	17.4	17.4	25.3
	Heart Failure - Rapid Atrial Fibrillation	1	,6	,6	25.8
	Acute pulmonary edema	25	14.0	14.0	39.9
	Acute Coronary Syndrome	25	14.0	14.0	53.9
	Acute Pulmonary Edema – Acute Myocardial Infarction	2	1.1	1.1	55.1
	Atrial Fibrillation	30	16.9	16.9	71.9
	Unstable Angina	6	3.4	3.4	75.3
	Angina pectoris	10	5,6	5,6	80.9
	Acute Pulmonary Edema -Rapid Atrial Fibrillation	1	,6	,6	81.5
	Angina– Atrial Fibrillation	1	,6	,6	82.0
	Chest pain	17	9.6	9.6	91.6
	Angina Fatigue	1	,6	,6	92.1

	Multiple Cardiovascular Unit Readmissions	4	2.2	2.2	94.4
	Coronary Heart Disease – Acute Pulmonary Edema	1	,6	,6	94.9
	Onset Pulmonary Edema - Dyspnea	1	,6	,6	95.5
	Non -Stemi	3	1.7	1.7	97.2
	Sudden shortness of breath	3	1.7	1.7	98.9
	Posterior sternal pain	1	,6	,6	99.4
	Precardial pain	1	,6	,6	100.0
	Total	178	100.0	100.0	

Table 10: Age and Cardiovascular Event

		Angina–Rapid Atrial Fibrillation	Paroxysmal Atrial Fibrillation	Heart Failure – Acute Pulmonary Edema	Acute Myocardial Infarction - Silent Ischemia	Acute Myocardial Infarction	Heart Failure – Rapid Atrial Fibrillation
Age grouped	40-49	0	0	0	2	5	0
	50-59	0	0	0	0	11	0
	60-69	0	2	1	0	2	0
	70-79	1	2	2	0	8	0
	80-89	1	0	3	0	5	1
Total		2	4	6	2	31	1

Table 11: Age and Cardiovascular Event

		Acute pulmonary edema	Acute Coronary Syndrome	Acute Pulmonary Edema – Acute Myocardial Infarction	Atrial Fibrillation	Unstable Angina	Angina pectoris
Age grouped	40-49	2	3	0	1	0	2
	50-59	0	6	1	4	2	1
	60-69	4	9	0	5	1	5
	70-79	10	5	0	13	2	1
	80-89	7	2	1	5	1	1
Total		23	25	2	28	6	10

Table 12: Age and Cardiovascular Event

		Acute Pulmonary Edema – Rapid Atrial Fibrillation	Angina – Atrial Fibrillation	Chest pain	Angina Fatigue	Multiple Cardiovascular Unit Readmissions	Coronary Heart Disease – Acute Pulmonary Edema
Age grouped	40-49	0	0	1	0	0	0
	50-59	0	0	6	0	0	0
	60-69	0	0	4	0	1	1
	70-79	0	0	5	1	2	0
	80-89	1	1	1	0	1	0
Total		1	1	17	1	4	1

Table 12: Age and Cardiovascular Event

		Onset Pulmonary Edema - Dyspnea	Non -Stemi	Sudden shortness of breath	Posterior sternal pain	Precardial pain
Age grouped	40-49	0	1	0	1	0
	50-59	0	0	1	0	0
	60-69	1	2	0	0	1
	70-79	0	0	1	0	0
	80-89	0	0	1	0	0
Total		1	3	3	1	1

Blood Sugar Measurements

Table 13: Patients with Diabetes Mellitus, Prediabetes and with normal blood sugar values

Gender * Crosstabulation Measurement Diagnosis					
Count					
		Measurement Diagnosis			Total
		Normal Blood Sugar Values	Diabetes	Prediabetes	
Sex	Man	8	73	39	120
	Woman	2	36	14	52
Total		10	109	53	172

Men - Age Grouped * Crosstabulation Measure Diagnosis					
Count					
		Measurement Diagnosis			Total
		Normal prices	Diabetes	Prediabetes	
Age grouped	40-49	1	6	9	16
	50-59	2	13	9	24
	60-69	3	19	7	29
	70-79	1	23	9	33
	80-89	1	12	5	18
Total		8	73	39	120

Women - Age Grouped * Crosstabulation Measure Diagnosis					
Count					
		Measurement Diagnosis			Total
		Normal prices	Diabetes	Prediabetes	
Age grouped	40-49	0	1	1	2
	50-59	0	4	4	8
	60-69	0	5	3	8
	70-79	1	13	4	18
	80-89	0	12	1	13
Total		1	35	13	49

Cardiovascular Event and Prediabetes

Table 14: Men-Cardiovascular Event and Prediabetes

Cardiovascular Event - Entry Diagnosis * Crosstabulation Measurement Diagnosis				
Count				
		Measurement Diagnosis		
		Normal prices	Diabetes	Prediabetes
Cardiovascular Event - Admission Diagnosis	Angina-Rapid Atrial Fibrillation	0	0	2
	Paroxysmal Atrial Fibrillation	1	1	0
	Heart Failure -Acute Pulmonary Edema	0	4	0
	Acute Myocardial Infarction - Silent Ischemia	0	1	0
	Acute myocardial infarction	2	14	8
	Heart Failure -Rapid Atrial Fibrillation	0	0	1
	Acute pulmonary edema	0	12	2
	Acute Coronary Syndrome	0	11	8
	Acute Pulmonary Edema - Acute Myocardial Infarction	0	2	0
	Atrial Fibrillation	1	10	6
	Unstable Angina	0	4	2
	Angina pectoris	1	3	2
	Angina - Atrial Fibrillation	0	0	1
	Chest pain	2	6	3
	Angina Fatigue	0	1	0
	Coronary Heart Disease - Acute Pulmonary Edema	0	0	1
	Non Stemi	0	2	1
	Sudden shortness of breath	0	2	1
	Posterior sternal pain	0	0	1
	Precardial pain	1	0	0
Total		8	73	39

Table 15: Women – Cardiovascular Event and Prediabetes

Cardiovascular Event - Entry Diagnosis * Crosstabulation Measurement Diagnosis				
Count				
		Measurement Diagnosis		
		Normal prices	Diabetes	Prediabetes
Cardiovascular Event-Admission Diagnosis	Paroxysmal Atrial Fibrillation	0	0	2
	Heart Failure -Acute Pulmonary Edema	1	1	0
	Acute Myocardial Infarction-Silent Ischemia	0	1	0
	Acute myocardial infarction	0	4	3
	Acute pulmonary edema	0	10	0
	Acute Coronary Syndrome	0	2	4
	Atrial Fibrillation	1	10	2
	Angina pectoris	0	1	2

	Acute Pulmonary Edema -Rapid Atrial Fibrillation	0	1	0
	Chest pain	0	5	1
	Onset Pulmonary Edema - Dyspnea	0	1	0
Total		2	36	14

Outcome

Table 16: Days of hospitalization

Outcome - Days of Hospitalization in the Coronary Unit (or Hours)					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Some hours	26	14.6	14.9	14.9
	1	16	9.0	9.1	24.0
	2	44	24.7	25.1	49.1
	3	37	20.8	21.1	70.3
	4	26	14.6	14.9	85.1
	5	16	9.0	9.1	94.3
	6	2	1.1	1.1	95.4
	7	2	1.1	1.1	96.6
	8	3	1.7	1.7	98.3
	17	2	1.1	1.1	99.4
	18	1	,6	,6	100.0
	Total	175	98.3	100.0	
Missing	System	3	1.7		
Total		178	100.0		

Table 17: Hospitalization days for men in the Coronary Unit

Outcome - Days of Hospitalization in the Coronary Unit (or Hours) – Men					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Some hours	22	17.9	18.0	18.0
	1	11	8,9	9.0	27.0
	2	31	25.2	25.4	52.5
	3	23	18.7	18.9	71.3
	4	19	15.4	15.6	86.9
	5	9	7.3	7.4	94.3
	6	2	1.6	1.6	95.9
	7	2	1.6	1.6	97.5
	8	1	,8	,8	98.4
	17	1	,8	,8	99.2
	18	1	,8	,8	100.0
	Total	122	99.2	100.0	
Missing	System	1	,8		
Total		123	100.0		

Table 18: Hospitalization days for Women

Outcome - Days of Hospitalization in the Coronary Unit (or Hours) - Women					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Some hours	4	7.3	7.5	7.5
	1	5	9.1	9.4	17.0
	2	13	23.6	24.5	41.5
	3	14	25.5	26.4	67.9
	4	7	12.7	13.2	81.1
	5	7	12.7	13.2	94.3
	8	2	3.6	3.8	98.1
	17	1	1.8	1.9	100.0
	Total	53	96.4	100.0	
Missing	System	2	3.6		
Total		55	100.0		

Table 19: Outcome - Continued (Total)

Outcome-Continued					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Transfer to Cardiology Clinic	94	52.8	53.4	53.4
	Transfer to a Tertiary Public Nursing Institution	19	10.7	10.8	64.2
	Transfer to a Private Treatment Center at the request of the family	38	21.3	21.6	85.8
	Death	15	8.4	8.5	94.3
	Discharge	7	3.9	4.0	98.3
	Transfer to the Pathology Clinic	1	,6	,6	98.9
	Transfer to the Pulmonology Clinic	1	,6	,6	99.4
	Transfer to the Intensive Care Unit	1	,6	,6	100.0
	Total	176	98.9	100.0	
Missing	System	2	1.1		
Total		178	100.0		

4. Discussion

The Cardiovascular Events with which the patients were admitted to the Coronary Unit were presented, as well as the outcome of these cardiovascular events, which outcome is presented as days of hospitalization in the Coronary Unit, since the duration of hospitalization in the Coronary Unit was directly related to the severity disease. At the same time, the outcome is related to the continuation of the hospitalization with the transfer of the patient to the Cardiology Clinic or as emergency transfers of the patients from the Coronary Unit to tertiary Public Nursing Institutions or to Private Treatment Centers. Finally, death was also considered as an outcome, whose rate was 8.2% for men and 9.3% for women in all cardiovascular events.

Cardiovascular events with which patients were admitted to the Coronary Unit, mainly related to Acute Myocardial Infarction, with a higher percentage in men than in women. Similarly, Acute Coronary Syndrome was found with a correspondingly high rate in men compared to women and indeed by a large difference. Interpretation, the female sex has natural protection, the female hormones, estrogens, which act protectively even after menopause until the age of 50-60 years (Sullivan, 2003, Pines *et al*. 1991, Prouder *et al*. 1994, Wu *et al*., 2001, Melidonis *et al*., 2002) [29, 24, 37].

Of all the patients who were admitted to the Coronary Unit (178 patients), 80 had a known history of Type 2 Diabetes Mellitus and one had a history of Type 1 Diabetes Mellitus. Another 28 patients were found who did not know that they had Type 2 Diabetes Mellitus and 53 patients with Prediabetes, high percentages and worthy of comment, as they converge with previous studies and reports and from the entire literature, regarding their relationship with the occurrence of cardiovascular events, as well as with the outcome of these and accompanying comorbidities (Taminaga *et al*. 1999, Melidonis, 2011) [24].

The percentages in terms of gender and the occurrence of a cardiovascular event agree with the international literature, as well as the modern estimates of the American Heart Association (AHA, 2016, Bodiga *et al*., 2014, Kourloumpa *et al*., 2006) [9]. Also, it was observed that male patients were younger compared to female patients, which verifies results of previous reports (Panagiotakos *et al*. 2001, Papathanasiou *et al*. 2004, Wu *et al*., 2001, Melidonis *et al*., 2002, Brown *et al*., 2000) [26, 23, 11].

Another large percentage of patients, who were admitted to the Coronary Unit were patients with a cardiovascular event in Atrial Fibrillation. The percentage was higher in women than in men and the difference reached ten percentage points. The highest prevalence was in the decade of 70-79 years and is in agreement with the literature, of which approximately 1/3 of patients with Atrial Fibrillation have a known comorbid history of Diabetes Mellitus and this worsens in old age (Santini *et al*. 2004, Hart *et al*. 2007). The percentage of patients, mainly elderly women with Diabetes Mellitus, obesity, Arterial Hypertension and Atrial Fibrillation, manifesting Heart Failure is constantly increasing (Rockson, Albers, 2004, Brown *et al*., 2000, Thrainsdottir *et al*., 2005) [11, 30]. In the grouped age of 70-79 years with Heart Failure the occurrence of Acute Pulmonary Edema occurs with an increased percentage in the female sex compared to men. Studies show that the percentage of these patients if they have a preserved Left Ventricular Ejection Fraction – usually defined as EF≥50%, in -hospital mortality is slightly lower than that of HF patients with reduced ejection fraction and increased in -hospital mortality (Massie *et al*. 2008, Desai *et al*. 2011, McMurray *et al*. 2012, Thrainsdottir *et al*., 2005) [22, 30].

Regarding silent ischemia, 1 man and 1 woman were recorded, who were admitted to the Coronary Unit with Acute Myocardial Infarction, which did not give symptoms and the diagnosis was made by chance, as the woman (Diabetes type 1, 44 years old) was hospitalized in the Obstetrics Clinic for a planned total hysterectomy and in the routine Electrocardiogram on the eve of the surgery, in the opinion of the Electrocardiogram by the specialist Cardiologist, Acute Myocardial Infarction was diagnosed. The man was also diagnosed by chance, as he sought help due to a respiratory infection and the Electrocardiogram for consultation was diagnosed with Acute Myocardial Infarction (60-year-old man, who was also diagnosed with Diabetes Mellitus, for which no knew of its existence). The percentage is small compared to what is reported in the literature, according to which of 522 patients with Type 2 Diabetes Mellitus without symptoms of Coronary Artery Disease, 113 (22%) presented positive bloodless tests for Coronary Artery Disease (Wackers *et al*. 2004).

The duration of hospitalization in the Coronary Unit, as an outcome, was directly related to the severity of the disease, the largest percentage during the hospitalization was held by the female sex, as they were old and with comorbidities (Sarker *et al*., 2009, Gaede *et al*., 2003) [28, 16].

Except outcome as a period of hospitalization in the Coronary Unit and then the transfer to the Cardiology Clinic for the continuation of the treatment process, the *outcome*

transfer to a Public or Private Nursing-Therapeutic Center was found, as expected, in a large percentage of men, as the percentage of Acute Myocardial Infarctions, Coronary Acute Syndrome was much higher in the male sex. The use of reperfusion in this case of thrombolysis in the Coronary Unit of the Secondary General Hospital, reaches a rate that can be compared with most European countries. Combined thrombolysis treatment and then transfer to an ICU for further treatment, as recent studies have shown the results of immediate thrombolysis and rapid transfer to an ICU are similar to those when the person enters the ICU directly (Cucherat *et al*. 2002, Antman *et al*. 2008) [12].

The outcome death shows a high rate compared to another prospective study (Sarker *et al*. 2007) [28], as well as from a Greek epidemiological study of Acute Coronary Syndrome (GREECS, 2003-2004) and this difference has to do with the fact that in the present retrospective study the outcome death corresponds to all cases-patients with any cardiovascular event, with which they were admitted to the Coronary Unit and not separately for each cardiovascular event.

From the total of 178 patients, 10 patients (8 men and 2 women) did not suffer from Diabetes Mellitus and normal blood sugar values were found in the measurements and were admitted with a cardiovascular event to the Coronary Unit. A limitation of the study is that the outcome of these CVD patients was not studied separately as CVD patients with an individual recall free of Diabetes Mellitus.

5. Conclusions

People with Diabetes Mellitus have a three to five times greater risk of developing coronary heart disease, even when other risk factors have been treated. It turns out that in addition to the well-known correlation between Diabetes Mellitus and Coronary Artery Disease, pre- diabetes, which acts subclinically, it is positively correlated with the occurrence of coronary artery disease in patients who are hospitalized in a Coronary Unit. The productive age (50-59 years) is the age group with the highest percentage of Acute Myocardial Infarction, while the elderly (70-79 years) for Atrial Fibrillation. About half of the patients with Acute Myocardial Infarction are further treated either with angioplasty-PCI-STENT or with Coronary Artery Bypass Grafting, CABG, while the prognosis was worse in women than in men. The early detection of diabetic and pre-diabetic patients and their effective treatment by the medical and nursing staff with monitoring protocols for diabetic patients with a holistic, interdisciplinary approach, participation of other health professionals, such as dietitians, nutritionists, training, reinforcement and empowerment for behavior modification, education and self-care enhancement, as well as strengthening the cooperation of cardiologists and diabetologists in order to reduce cardiovascular events and their complications in the population.

6. References

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