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PREVALENCE OF ACS IN AVICENNA BALKHI TEACHING HOSPITAL IN AFGHANISTAN

One third of global deaths are caused by CVD, and the most common is IHD. Approximately 80% of IHD which is caused by atherosclerosis, with the remainder caused by non-atherosclerotic causes such as VHD, radiation, vasculitis, and other.

To study the prevalence of ACS in Avicenna Balkhi Teaching Hospital.

This is a retrospective cross sectional study, we collected data of 180 ACS patients from 01.01.2019 till 01.06.2019 in Avicenna Balkhi Teaching Hospital; data was evaluated on clinical traits, treatment, and outcome in ACS patients.

180 patients of ACS admitted during the first six months of 2019. From the aforementioned ACS%, 62.7% (113) were STEMI and 37.2% (67) were NSTEMI/UA, with a male to female ratio was 2.64:1. 66.7% of patients had an age of 60 – 79 years. The mean time of patients' admission in CCU was15.5h and was higher in NSTEMI/UA than STEMI (18.3 h vs 11.8 h) respectively. Treatment of all ACS patients such as STEMI, NSTEMI, UA was the same in 90% and received antiplatelet, statins, anticoagulants, anxiolytics. 30,4% of STEMI patients received thrombolytic therapy with streptokinase (which is available in Afghanistan), just 10% from 30.4% we saw the effective role of streptokinase. The most common comorbidity diseases include; Hypertension 45.6%, DM 22.2%, Smoking 27.8%, Heart failure 21.7%, COPD 5.6%.

Most of the ACS patients were STEMI, which was more male than female. More than 50% of patients had an age of 60-79 years old, the mean time of admission in the CCU room was more than 10, and the most common comorbidities were HTN, smoking, DM and heart failure. Increasing public awareness of heart disease, expanding professional medical staff capacity, and outfitting the cath lab and cardiac surgery ward. Finally, this study will serve as a resource for future research.

Key words: ACS, IHD, STEMI

Introduction

Cardiovascular disease is responsible for 33.3% of deaths around the world [1]. There are lots of cardiovascular diseases but ischemic heart disease is the most common one [2]. In approximately 80% of IHD, the cause is atherosclerosis (ACD) [3]. In most cases (70%) multiple risk factors are responsible for IHD, and in 4.5% have no risk factors [4]. Besides modifiable risk factors in past several decades age of population is getting rise [5,6] and united nation predict that number of individuals over 65 years from one in 11 in 2019 may increase to one in six in 2050 [7]. Sleeplessness, mood and affect disorders, social problems contribute IHD in new population [8, 9]. Cost either for treatment, primary and secondary prevention regarding IHD will rise from 863million USD to 1 trillion USD in 2030 [10]. In developing countries, the frequency of non-ST elevation ACS is two to three times higher than in women on average. Men are much more likely than women under the age of 60 to develop ACS, but women account for the majority of patients over 75 years [11, 12]. In Europe, three-fifths of all CVD deaths occur in people over 75, and one-fifth of all CVD deaths occur in people under 65. CVD affects the lives of more men (0.9 million) than women (0.5 million) before they reach 75; but, owing to the larger number of overall premature deaths in men, CVD claims the lives of both sexes before they reach 75 [13]. In comparison to those between the ages of 35 and 64, the overall incidence of CHD is double for men and triple for women between the ages of 65 and 95. The most serious effects of CHD, such as myocardial infarction and sudden death, are uncommon in premenopausal women. Following menopause, the incidence and severity of coronary heart disease (CHD) increases dramatically.

Unfortunately, in Afghanistan we have not performed any standard research regarding compiling data especially in cardiology field yet. Between 2009 and 2014 Kabul NATO role 3 hospital provided medical services to NATO coalition military forces whom were engaged in Afghanistan as well as Afghan national security forces and non-Afghan civilian from Jun 16 th and October 1th 2012 [14], during this time 52 patients were assessed that most of them were non Afghan citizens.34.2% were suffered from acute coronary syndrome and 76.9% of these ACS were civilians, 30.8% diagnosed cardiomyopathy [15].Among four patients with STEMI, three of them had fatal complications such as death, acute heart failure, and failed of thrombolysis [16]. The aim of this study is to reveal prevalence of ACS in Avicenna Balkhi Teaching Hospital during 2019, and correction of other comorbidities in outcome of ACS, and will offer some recommendations for early detection of ACS.

Aim: To determine the prevalence of ACS in Avicenna Balkhi Teaching Hospital.

Materials and Methods

This is a descriptive cross sectional retrospective study of all registered patients presenting with ACS from 01.01.2019 till 01.06.2019 in the emergency room (ER) were included in the study. Detailed history, physical examination, and necessary investigations were done in all patients. These data were arranged by IBM SPSS 22 and excel to compare variables. Independent T test for analysis of grouping variables with scale variables, one sample T test for comparison of scale variable with scale variable from literatues,chi squire test for inferential statistic of categorical data and one way ANOVA for correlation of dependent and independent variables. Included patients were; Patients who visited ER due medical problems and completed lab exams after that they diagnosed ACS and patients should have the diagnostic criteria of ACS as given below;

Diagnosis of MI was made if there is: Typical rise and gradual fall (troponin) or more rapid rise and fall (CK-MB) of biochemical markers of myocardial necrosis with at least one of the following:(a) Ischemic symptoms; (b) Development of pathologic Q waves on the ECG;(c) ECG changes indicative of ischemia (ST segment elevation or depression) ,[11].

Unstable Angina (UA) was defined as angina pectoris (or equivalent type of ischemic discomfort) with at least one of three features:(1) occurring at rest (or minimal exertion) and usually lasting >20 min (if not interrupted by nitroglycerin administration); (2) being severe and described as frank pain, and of new onset (i.e., within 1 month; and (3) occurring with a crescendo pattern (i.e., more severe, prolonged, or frequent than previously).(4) Patients with above features without elevation in cardiac markers were categorized as UA) [12].

Clinical and lab findings which were analyzed include; age,gender,HTN, DM, smoking, BMI, family history of CHD, ECG finding, echocardiography findings, cardiac biomarkers, complications, and treatment .Considering of atypical presentations like dyspnea, nausea/vomiting, indigestion, fatigue, sweating, and arm or shoulder pain in the absence of chest pain[12].

Unfortunately, absence of equipped cardiology centers, fully experienced physicians in cardiology fields especially in interventional and cardiac surgery increased mortality rate due to ACS in north zone of Afghanistan (Avicenna Balkhi Teaching Hospital).

Result

Total number of acute coronary syndrome patients were 180 patients, from aforementioned ACS % 62.77% (113) of all registered patients were STEMI, and 37.2%(67) NSTEMI or UA, male female ratio (2.64:1) (Table 1). Mean of age in this study was 66.43±13.38 years. 8.4% of male and 16.3% of female had age of under 39 years,13.7% of male and 18.4% of female had age between 40 - 59 years,69.5% of male and 59.2% of female had age between 60 -79 years , and finally 8.4% of male and 6.1% of female had age over 80 years.(P V = 0.329). Mean time to admission in CCU was15.5h and was higher in NSTEMI/UA than STEMI (18.3 h vs 11.8 h)(Figure 1,2).Atypical presentations of IHD were common in NSTEMI/UA. Treatment of all ACS patients such as STEMI ,NSTEMI,UA are the same in 90% and received antiplatelet, statins, anticoagulants, ACEI/ARB, Beta-Blocker, anxiolytics (table 2, figure 3). 30,4% of STEMI patients received thrombolytic therapy with streptokinase

(which is available in Afghanistan),just in 10% from 30.4% we saw the effective role of streptokinase. The mean time for door to needle was 2h and 23min. Number male ACS patients who had heart failure 21.4% and female was 22.4%. (table3,figure4) (PV =0.876) 67.9% of male and 61.2% of female had normal BMI , 5.3% of male and 6.1% of female were in pre- obesity stage ,16.8% of male and 16.3% of female were in obesity stage – 1 , 6.1% of male and 8.2% of female had obesity – 2 , 3.8% of male and 8.2% of female had obesity – 3 (PV =0.761)(table4,figure5). In this study diabetes mellitus seen in 23.7% of male and 18.4% of female.(PV =0.447), and HTN was seen in 38.9% of male and 63.3% of female. (PV=0.004). Percentage of COPD as comorbidity disease in ACS was 5.3% in male and 6.1% in female. (PV = 0.839).finally hyperlipidemia as a risk factor seen in 35.1% of male and 26.5% of female, PV(0.275).(table5,figure6). 27.8% of ACS patients were either current smoker or smoker in the past (Table 6).

Table 1 – General characteristics of study population

General characteristic of study population		Sex				Test of difference	
	Male		Female				
	Number	%	Number	%	$\chi 2$	PV	
Age Group	< 39 y	11	8.4%	8	16.3%	3.436	0.329
	40 - 59 y	18	13.7%	9	18.4%		
	60 -79 y	91	69.5%	29	59.2%		
	>80 y	11	8.4%	3	6.1%		
BMI Group	Normal	89	67.9%	30	61.2%	1.86	0.761
	Pre-Obese	7	5.3%	3	6.1%		
	Obesity -1	22	16.8%	8	16.3%		
	Obesity - 2	8	6.1%	4	8.2%		
	Obesity - 3	5	3.8%	4	8.2%		
HF	No	103	78.6%	38	77.6%	0.24	0.876
	Yes	28	21.4%	11	22.4%		
DM	No	100	76.3%	40	81.6%	0.579	0.447
	Yes	31	23.7%	9	18.4%		
COPD	No	124	94.7%	46	93.9%	0.041	0.839
	Yes	7	5.3%	3	6.1%		
HTN	.No	80	61.1%	18	36.7%	8.514	0.004
	Yes	51	38.9%	31	63.3%		
Hyperlipidemia	.No	85	64.9%	36	73.5%	1.193	0.275
	Yes	46	35.1%	13	26.5%		

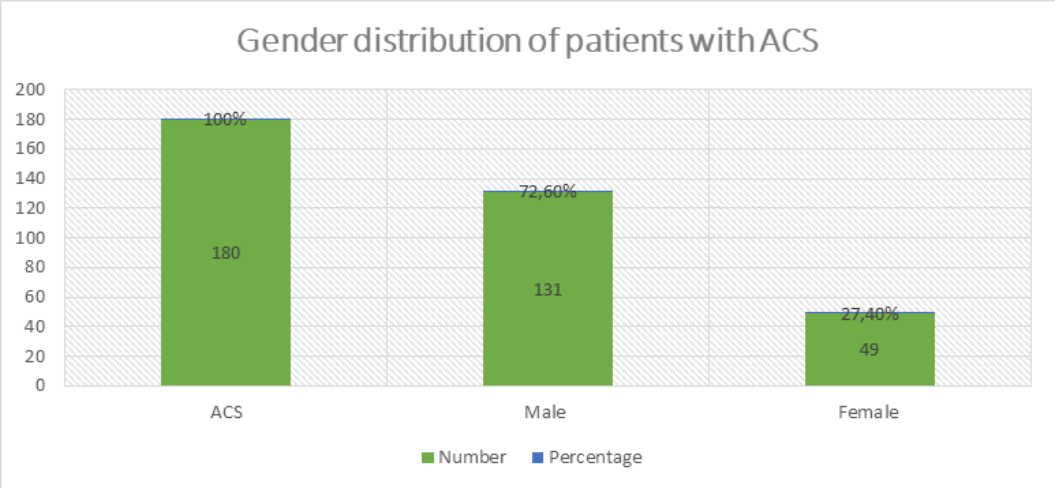

Figure 1 – Relation of Gender with ACS

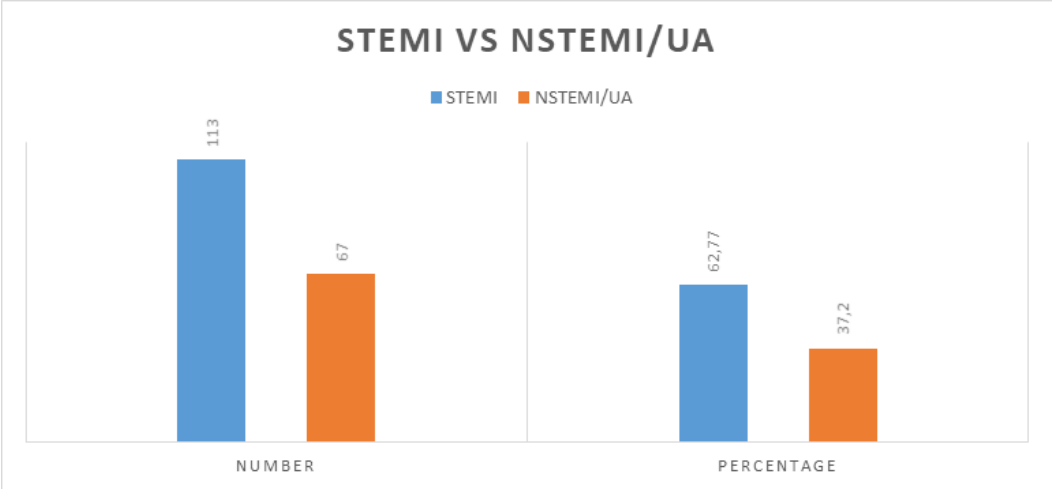

Figure 2 – Types of ACS (STEMI &NSTEMI/UA)

Table 2 – Age category and sex

		Sex				Test of difference	
	Male		Female				
	Number	%	Number	%	χ2	PV	
Age Category	Under 39y	11	8.4%	8	16.3%	3.436	0.329
	40 - 59 y	18	13.7%	9	18.4%		
	60 - 79 y	91	69.5%	29	59.2%		
	Over 80 y	11	8.4%	3	6.1%		

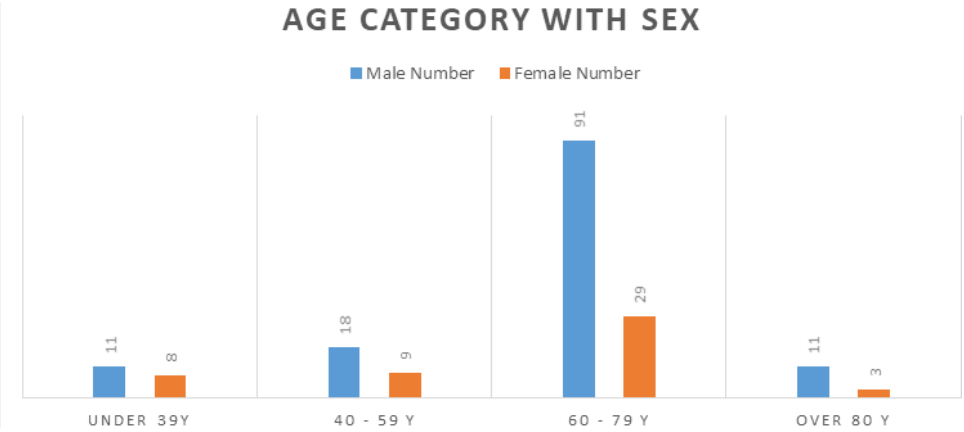

Figure 3 – Age category with sex

Table 3 – Heart failure in ACS patients according to sex

		Sex				Test of difference	
	Male		Female		$\chi 2$	PV	
	Number	%	Number	%	0.024		
HF	No	103	78.60%	38	77.60%	0.876	
	Yes	28	21.40%	11	22.40%		

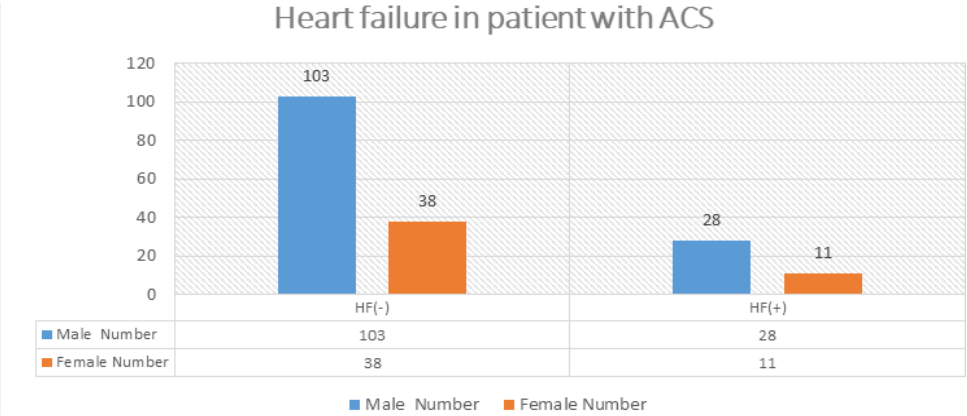

Figure 4 – Heart failure in ACS patients

Table 4 – BMI in ACS patients

		Sex				Test of difference	
	Male		Female				
	Number	%	Number	%	$\chi 2$	PV	
BMI Category	Normal	89	67.9%	30	61.2%	1.86	0.761
	Pre-Obese	7	5.3%	3	6.1%		
	Obesity -1	22	16.8%	8	16.3%		
	Obesity - 2	8	6.1%	4	8.2%		
	Obesity - 3	5	3.8%	4	8.2%		

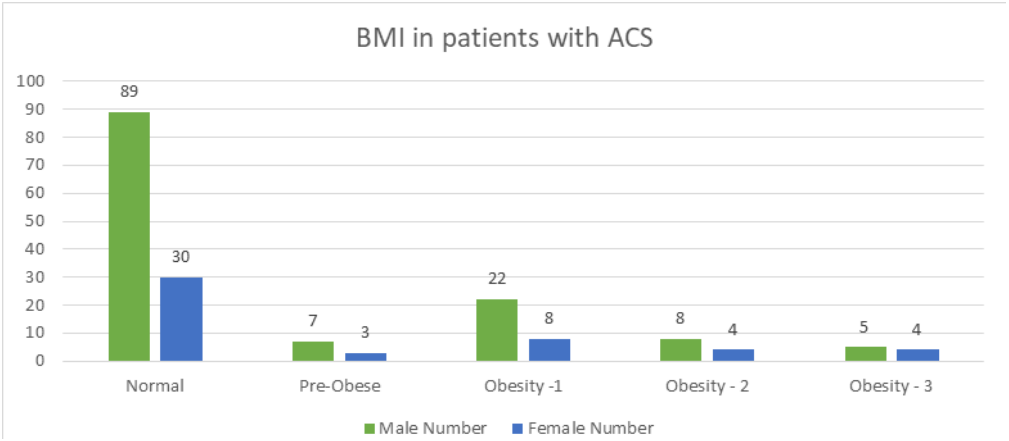

Figure 5 – BMI in ACS patients

Table 5 – DM, COPD, HTN and hyperlipidemia as comorbidity diseases in ACS

		Sex				Test of difference	
	Male		Female				
	Number	%	Number	%	χ2	PV	
DM	No	100	76.3%	40	81.6%	0.579	0.447
	Yes	31	23.7%	9	18.4%		
COPD	No	124	94.7%	46	93.9%	0.041	0.839
	Yes	7	5.3%	3	6.1%		
HTN	No	80	61.1%	18	36.7%	8.514	0.004
	Yes	51	38.9%	31	63.3%		
Hyperlipidemia	No	85	64.9%	36	73.5%	1.193	0.275
	Yes	46	35.1%	13	26.5%		

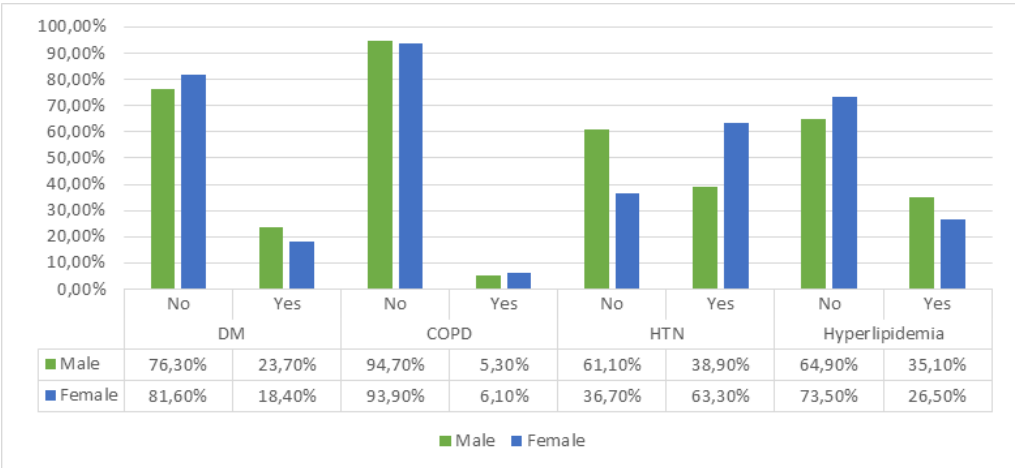

Figure 6 – DM, COPD, HTN and hyperlipidemia as comorbidity diseases in ACS

Table 6 – Smoking in ACS patients

Smoking in ACS patients										
F		Levene's Test		t-test for Equality of Means						
		Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
Smoking	Equal variances assumed	1.575	.211	.600	178	.550	.045	.075	-.104	.194
	Equal variances not assumed			.613	89.972	.542	.045	.074	-.101	.192

Discussion

This is the first study of ACS prevalence inNorth zone of Afghanistan that will be published in a foreign journal. Similar studies were performed in some Asian countries; during this study, we found some significant differences, and some similarities with other studies.

In our study of STEMI was 62.77%, while in a study that was done by Farhin Iqbal et al in north west of India showed 72.4% [16], we can introduce some reasons that why prevalence of STEMIis lower than north west of India; Patients' and their relatives' perception and knowledge of heart disease is very low. Therefore, most patients do notgo to the doctor or hospital in the early stages of thedisease. Afghanistan is a war-torn country and most of Afghanistan's population live below the poverty line and is unable to make a living on a daily basis. The exorbitant costs of treating heart disease cannotbe paid in any way. Why the prevalence of ACS is low? low of misperception of patients regarding heart diseases, inattention to diseases, Inability to perform examinations before the disease, Inability to continue treatment due to economic problems, lack of equipped heart centers in Afghanistan and lack of professional staff in the heart disease department, also in Afghanistan we do not have anycomputer base registration system, all of registrationis hand writing base. In a study by Shukri M. Al- Saif et al showed that 77% of ACS patients were male [17], in our study 72.8% of patients weremale ,according to some wrong accepted traditions, even in some literate families when some of femalemember of family become sick they ignore their sicknesses, and other relatives ignore too, even they don't want to be admitted in hospital.In this study the incidence of HTN as a risk factor for AMI is 55% [17] ,whereas in our collected data prevalence of HTN is 45.6%,we face with lots of patients that come to hospital for some other problems, when responsible physicians check their blood pressure, show high and patients even have no any sensible signs and symptoms to accept that have high blood pressure, even if they are known patients of HTN either emergency ,urgency or malignant HTN , they don't visit regularly their responsible physicians. In another study named "Temporal trends in the prevalence and outcomes of geriatric patients with acute myocardial infarction in Japan–A report from the Miyagi AMI Registry Study" by Koichi Sato,et al in Japan examined total of 6596 AMI from 2005 to 2016 , male –female ratio was 4.141;2.455, they divided them in age sub groups; ag[70–79y (n = 3,485), 80–89y (n = 2,601), and _90 years (n = 510)] [15]. Same as our finding in Avicenna Balkhi Teaching Hospital. In another study under name of "prevalence of Acute Coronary Syndrome in the General Medicare Population, 1992 to 2009" was performed by Gautam R, et al show that there are some fluctuations in the aspect of age of patients during 1992 to 2009., the proportion of patientsaged 65 to 74 years decreased from 56% to 50%, while the proportion older than 84 years increased from11%to 15%. However, the proportions of women (60% to 58%) and white patients (88%to 87%) remained relatively constant. The annual unadjusted prevalence of ACS was about 2.4%to 2.5%until 2002 and then steadily declined to about 1.7% in 2009. (Figure, A). The incidence of unstable angina steadily declined (from 1.5% in 1997 to 0.6%in 2009; Figure, B), but that of AMI

remained constant, about 1.2%to 1.4%, throughout the study period (Figure,C). This trend was similar for all age, sex, and race groups except patients older than 84 years, in whom the ACS incidence Initially increased, from2.8%in 1992 to 3.4%in 2002, and then declined to 2.6% by 2009 % [16].

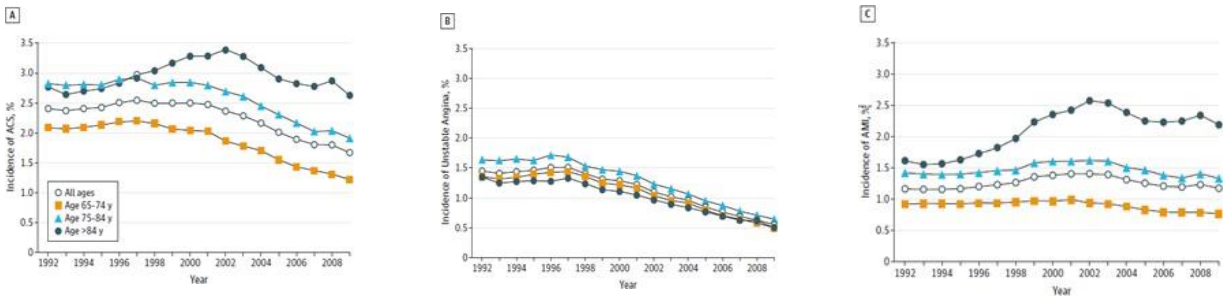

Figure – A, B, C. Best diagnostic and therapeutic procedure of ACS is angiography and angioplasty; as previously mentioned in Afghanistan this facilities are impossible in most governmental and private hospitals, except in one or two private hospitals in capital of Afghanistan Kabul.

Study limitations

Certain limitations of this study are; first this is a single center base study of ACS, and may differ from other centers in other cities of Afghanistan even may differ from other centers in Balkh province. Second, all of patients' documents are not saved and registered in computer data base so there are lots of problem in documents of patients .Third, in Avicenna Balkhi Teaching Hospital we don't have any equipped ward of cardiology with professional physicians, even though this hospital is training center for new generation of physicians in different fields. Forth, patients and their relatives in most of the cases do not give full information about their illnesses, some time they leave CCU room without permission of responsible physician. Fifth, until now in Afghanistan, there is no any formal academic publications to encourage medical staffs to research regarding different subject, and finally we have not seen yet, that governmental officials support medical staffs in research fields.

Conclusion

These data represent the first reported studyon spectrum of ACS in North zone of Afghani- stan and this is the first study will published in foreign journal, we tried our best to collect data significantly acceptable. The majority of ACS patients had STEMI, which was more common inmen than in women. More than half of the pa-tients were between the ages of 60 and 79, most ofthe patients admitted in the CCU room ten hoursafter onset of symptoms, and the most prevalentcomorbidities were HTN, smoking, diabetes, andheart failure. Citizens' economic troubles, a lackof awareness about cardiac diseases, and patients'refusal to follow doctors' advice can all lead to apoor prognosis. Our recommendations are; Rais-ing people's awareness of heart diseases, increas-ing the capacity of professional medical staffs,equipped the cath – lab and cardiac surgery ward. 1 – Most of ACS cases were in 60-79 years old (male 69.5%, female 59.2%, P value =0.333).

2 – Male – female ratio was 2.64:1.

3 – 21.40% of male, and 22.40% of female had heart failure, (P value = 0.87), most of the patients had normal BMI (male 67.9% , female 61.2%, P value = 0.76), 23.7% of male and 18.4% of female involved with diabetes mellitus,(P value = 0.44), 38.9% of male 63.3% of female had high blood pressure, (P value =0.004), and 35.1% of male and 26.5% of female had hyper- lipidemia, (P value = 0.27).

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