RESEARCH ARTICLE

CHEST PAIN IN A SAMPLE OF IRAQI ELDERLY PATIENTS.

Dr. Hussain N Sh[1], Dr. Ghaidan L Sh[1] and Dr. Hussien Y A[2].
1. Internal medicine specialist, Elderly Clinic at Al-Yarmouk teaching hospital, Baghdad.
2. Elderly clinic, Al-Yarmouk Teaching Hospital.

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Manuscript Info	*Abstract*
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	Introduction: Recently there has been a sharp increase in the number of older persons worldwide. Chest pain in the geriatric population is one of the most common and life-threatening complaints. They are more likely to present with atypical symptoms and nonspecific physical findings, putting them at increased risk for misdiagnosis. **Methodology:** A 60 years and older patients with chest pain were recruited to participate in a cross-sectional study. An instrument was designed for the purpose of the work filled by direct interview method. **Results:** Constricting type of pain formed the highest rate 32.7%, it was moderate to severe in 58.4%, and 57.4% perceived the pain at the mid-central area of the chest. Electrocardiography changes showed significant relationship with ischemic heart diseases in 49.5% of the patients. Echo- cardiology study showed finding went with ischemic heart disease in only 23.8%, mainly in form of ischemic pattern (41.7%). **Conclusion:** Chest pain is one of the most frequent complaints in the elderly population presenting to hospital. Aging may cause the clinical picture of chest pain to show atypical presentation.

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Introduction:-

Recently there has been a sharp increase in the number of older persons worldwide (Hafez, 2000). Aging is an inevitable part of life and brings along two inconvenient events: physiologic decline and disease state (Lionakis et al., 2012). During the period from 2010 until 2050, the number of older people in less developed countries is subjected to increase more than 250 percent, compared with a 71 percent increase in developed countries. This remarkable phenomenon is being driven by and improvements in longevity and declines in fertility (WHO, 2011).

This progressive aging of the people has led to an increase in chronic diseases, especially diabetes mellitus and hypertension, the main primary causes of cardiovascular diseases (Silva et al., 2018). One of the major epidemiologic trends of the current time is the rise of chronic and degenerative diseases throughout the world (WHO, 2011).

There are two major components of the "epidemiologic transition": first is age distribution from younger to older; and second increasing life expectancy and reordering of the relative importance of different causes of death (McKeown, 2009).

Corresponding Author:- Hussain N Sh.
Address:- Internal medicine specialist, Elderly Clinic at Al-Yarmouk teaching hospital, Baghdad.

It is important to understand what it means to be a patient, both from the perspective of the elders and from the perspective of the care providers (Bente et al., 2007). The medical information and history of elderly patients which are often complicated and long, must follow with them and be successfully communicated to each new health provider (Kessler et al., 2013).

Chest pain in the geriatric population is one of the most common and potentially life-threatening complaints. They are more likely to present with atypical symptoms and nonspecific physical findings, putting them at increased risk for misdiagnosis (Kelly, 2007).

It is found that, up to 33% of patients diagnosed with myocardial infarction did not present with typical chest pain. Therefore, early and accurate diagnosis of acute coronary syndrome is essential for subsequent therapy (Hung et al., 2010). Whereas typical angina pain remains common in elderly patient, an increased percentage of older versus younger patients have atypical manifestations of myocardial ischemia, including dyspnea and worsening heart failure (Gurwitz et al., 1997; Williams et al., 2002; Brieger et al., 2004).

The objective of this study was to evaluate chest pain as a chief complaint among the elderly patients attended the elderly clinic.

Methodology:-
A cross-sectional study conducted in a specialized clinic in Al-Yarmouk teaching hospital in Baghdad. The study started at 1st February through end April 2018.

A60 years and older patients with chest pain of ischemic nature were recruited to participate in the study after explanation of the research work and giving an oral consent.

An instrument was designed for the purpose of the research. It was revised by a committee of expert. It covers the sociodemographic variables in addition to details about the chest pain description, site, radiations, factors precipitating and factors alleviating the pain, and duration. ECG and Echo findings were reported for all the patients. The instrument was filled in by direct interview to overcome some expected difficulties like illiteracy of some patient, unable to understand some questions, and to save time.

A pilot study: conducted in the same clinic along one day work, the atients in the pilot study were not included in the study.

Statistical issue: using the SPSS V20 software program the data was grouped, analyzed, and tabulated. BMI was calculated for all the subjects by dividing the weight in Kgs on the square height in meters. Chi-square test used to discover the relationship between variables.

Results:-
This study covers 101 elderly patient, the range of the age was (60-82) year with mean age of 66.4±5.1year. Fifty seven were male (56.4%) and 44 female (43.6%). Majority were married 80.2% the remaining 19.8% were widowed. One third of the sample 34.7% were not able to read and wright, still 16.8% end their high education level. Majority of the study group were not working 94.1% and the remaining 5.9% working. About half of the sample 53.5% were none smokers the other half were either current or past smokers. These sociodemographic variables presented in (table 1).

Table 2 showed that constricting type of pain formed the highest rate 32.7% among the chest pain followed by pricking nature of pain 28.7%. The pain was mild in 41.6% of the patient and was moderate to severe in 58.4%. More than half of the patients 57.4% perceive the pain at the mid-central area of the chest. The pain radiate to the shoulder in 34.7% of the patients. The pain last only few minutes in 48.5% of the patients while patients complaining of pain lasting for more than one hour forming 16.8% of the total patients.

There are many factors precipitating chest pain among them exertion is the most frequent one at a rate of 39.6% followed by anxiety at a rate of Rest was found the most important alleviating factor at a rate of (45.5%)(table 3).

From table 4 we noticed that ECG record showed significant changes related to ischemic heart diseases was seen in only 49.5% of the patients, mainly in form of ST changes 57.1% of them. Echo study showed finding went with ischemic heart disease in only 23.8%, mainly in form of ischemic pattern (41.7%).

Table 5 represents the concomitant chronic diseases in the study group; 44.6% have one disease, 38.6% have two diseases, and 5.9% have more than two diseases. Among these diseases hypertension and diabetes mellitus were the most prevalent diseases.

Table 6 showed a constricting type of pain tend to be moderate to severe one in 78.8% of the patients and 21.2% had mild pain. While pricking pain was mild in 62.1% of patients and moderate to severe in the remaining 37.9%. The relationship between the type of pain and its' severity was found to be significant ($p = 0.025$).

The relationship between severity of chest pain and BMI groups was significant ($p = 0.003$), the rate of severity of pain increased with increasing in BMI. While the relationship between severity of chest pain and concomitant chronic diseases was not significant ($P = 0.783$).

Table 7 revealed that the severity of chest pain had no significant relationship with both ECG and Echo findings ($p = 0.232$ and 0.783 respectively). Again the relationship was not significant with number of concomitant chronic disease in the patients in the study group ($p = 0.206$).

Discussion:-
Age: Many guidelines for the age of geriatric people were set. The United Nation agreed cutoff is 60+ years to define the older or elderly persons (WHO, 2018). This cutoff point was considered in the elderly clinic where this study was conducted. Conventionally, "elderly" has been defined as a chronological age of 65 years old or older (Orimo et al., 2006; Grabowski et al., 2007; Singh and Bajorek, 2014). The ageing process is not similar across the population because of the differences in genetics, lifestyle, and overall health (Levine, 2013).

Chest pain: More than quarter of patients in this study has constricting type of chest pain. The elderly appear to have a somewhat reduced pain perception (Hung et al., 2010), and if they have the pain then high rate of them would have atypical presentation leading to a worse prognosis (Brieger et al., 2004).

Locality: More than half of the patients in the current study perceive the pain at the mid-central area of the chest. Although it is important, the location of pain should not be used by itself to exclude potential life-threatening diagnoses (Kelly, 2007).
Duration: Chest pain last only for few minutes in about half of the sample (48.5%). Neither fleeting pain lasting seconds nor constant pain that is unremitting for weeks is typical of myocardial ischemia (Kelly, 2007)**.**

ECG: is efficient as a rapid and convenient bedside test for the detection of ischemia at rest or under stress test in the diagnosis of acute coronary syndrome (Hung et al., 2010). In this study only fifty percent of the patients showed ECG changes that are relevant to ischemic heart disease, mainly in form of ST segment changes 57.1% of them. It has been shown that elderly patients with ischemia are less likely to have typical ECG findings than younger patients. They are less likely than younger to present with ST segment elevations. Comparison with previous ECGs is thus necessary (Hung et al., 2010). This study explore the relationship between intensity of pain and ECG changes which was not significant ($p = 0.232$).

Echo: Ischemic pattern Echo study reported in 23.8%. The relationship between chest pain and Echo study in the current study was not significant ($p = 0.783$).

Concomitant chronic diseases: Among the subject in the study, 44.6% have one concomitant chronic disease, 38.6% have two diseases, and 5.9% have more than two diseases. Hypertension and diabetes mellitus were the most prevalent diseases. This is expected since we are dealing with old age patients. The coexistence of several diseases may cause the clinical picture to be uncharacteristic (Goch et al., 2018).

Conclusion and recommendations:-
Chest pain is one of the most frequent complaints in the elderly population. Several diseases often coexist, so atypical presentation is common. ECG And Echo not necessarily show relevant findings in all patients. Intensity of

chest pain varies with different variables. A comprehensive geriatric assessment with high clinical suspicion is required to improve patient care.

Conflict of interest: none declared

Table 1:- Sociodemographic characteristics of the sample

Variables (N=101)		N	%
Age groups	60-69	74	73.3
Mean (SD) = 66.37(5.07)	70-82	27	26.7
Gender	Male	57	56.4
	Female	44	43.6
Marital status	Married	81	80.2
	Widow	20	19.8
Education status	not read not wright	35	34.7
	Primary	26	25.7
	Secondary	23	22.8
	Higher	17	16.8
Working status	Not working	95	94.1
	Working	6	5.9
Smoking status	Current smoker	13	12.9
	Past smoker	34	33.7
	None-smoker	54	53.5

Table 2:- Chest pain description

Chest pain		N	%
Types	constricting	33	32.7
	pricking	29	28.7
	heaviness	20	19.8
	burning	10	9.9
	throbbing	9	8.9
Severity	mild	42	41.6
	Moderate to sever	59	58.4
Place	mid-central chest	58	57.4
	to the left	39	38.6
	to the right	3	3.0
	Upper chest	1	1.0
Radiation	left shoulder	35	34.7
	no radiation	20	19.8
	back	19	18.8
	right shoulder	17	16.8
	base of neck	10	9.9
Duration	few mint	49	48.5
	>1hr	17	16.8
	<1hr	10	9.9
	continuous	11	10.9
	intermittent	14	13.9
	Total	101	100

Table 3:- Precipitating and alleviating factors for chest pain

Precipitating/Alleviating factors (N=101)		N	%
Precipitating factors	exertion	40	39.6
	anxiety	15	14.9
	stress	10	9.9
	even at rest	10	9.9
	none	9	8.9

	walking	7	6.9
	Eating	4	4. 0
	lying down	3	3.0
	talking	3	3.0
Alleviating factors	rest	46	45.5
	rest & medications	39	38.6
	medications	13	12.9
	stop eating	3	3.0

Table 4:- Electrocardigraphic (ECG) and Echo studies of the patients with chest pain in the study group

Procedure			N (%)
ECG			
Normal			26 (25.7)
Abnormal with unrelated changes to chest pain			25 (24.8)
Abnormal with a related changes to chest pain			49 (49.5)
	ST changes	28(57.1)	
	T-inversion	14(28.6)	
	QRS-changes	2(4.1)	
	ST-depression & T- inversion	6(12.2)	
	total	49(100)	
Echo			
Normal			6(5.9)
Abnormal with unrelated changes to chest pain			71(70.3)
Abnormal with a related changes to chest pain			24(23.8)
	Hypokinesia	5(20.8)	
	Valvular lesion	9(37.5)	
	Ischemic heart disease	10(41.7)	
	total	24(100)	
Total			101(100)

Table 5:- concomitant chronic diseases in the study patients

Chronic diseases			N	%
One disease			45	44.6
	HT	41(40.6)		
	DM	4(2)		
Two diseases			39	38.6
	DM&HT	37(36.6)		
	HT&Thy	2(2.0)		
More than two diseases			6	5.9
	DM&HT&Thy	4(3.9)		
	DM&HT&As	1(1)		
	HT&Thy&As	1(1)		
None			11	10.9
Total			101	100
HT: hypertension; DM: Diabetes mellitus; Thy: Thyroid gland disease; As: Asthma				

Table 6:-The relationship between severity of chest pain and type of pain, concomitant chronic diseases, and body mass index of the patients

Type of chest pain	Severity of chest pain		Total	Chi-Sq test P-value
	Mild	Moderate to sever		
Constricting	7(21.2)	26(78.8)	33(100)	11.188
Pricking	18(62.1)	11(37.9)	29(100)	0.025

Heaviness	9(45)	11(55)	20(100)	
Burning	4(40)	6(60)	10(100)	
Throbbing	4(44.4)	5(55.6)	9(100)	
BMI group				
Normal	11(52.4)	10(47.6)	21(100)	11.857
Overweight	19(61.3)	12(38.7)	31(100)	.003
Obese	12(24.5)	37(75.5)	49(100)	
Chronic diseases				
One disease	23(51.1)	22(48.9)	45(100)	4.567
Two diseases	13(33.3)	26(66.7)	39(100)	0.206
More than two diseases	1(16.7)	5(83.3)	6(100)	
None	5(45.5)	6(54.5)	11(100)	
Total	42(41.6)	59(58.4)	101(100)	
BMI: body mass index				

Table 7:- The relationship between severity of chest pain and electrocardiographic and Echo findings

ECG changes	Severity of chest pain		Total	Chi-Sq test P-value
	Mild	Moderate to sever		
Related to chest pain	25(50)	25(50)	50(100)	2.923
Not related to chest pain	8(32)	17(68)	25(100)	0.232
Normal ECG	9(34.6)	17(65.4)	26(100)	
Total	42(41.6)	59(58.4)	101(100)	
Echo findings				
Related to chest pain	11(45.8)	13(54.2)	24(100)	0.488
Not related to chest pain	28(39.4)	43(60.6)	71(100)	0.783
Normal Echo	3(50)	3(50)	6(100)	
Total	42(41.6)	59(58.4)	101(100)	

References:-
1. Bente, H., Lis, W. and Elisabeth, O. (2007): The elderly patient's dignity. The core value of health. International Journal of Qualitative Studies on Health and Well-being., 2: 3,160-168.
2. DOI: 10.1080/17482620701472447
3. Brieger, D., Eagle, K.A., Goodman, S.G., Steg P.G., Budaj A., White K., Montalescot G. (2004): Acute coronary syndromes without chest pain, an underdiagnosed and undertreated high-risk group: insights from the Global Registry of Acute Coronary Events. Chest, 126: 461–9. [Abstract]
4. Goch, A., Misiewicz, P., Rysz, J. and Banach, M. (2009): The clinical manifestation of myocardial infarction in elderly patients. Clin. Cardiol., 32 (6): e46–e51. DOI:10.1002/clc.20354
5. Grabowski, D.C., O'Malley, A.J. and Barhydt, N.R. (2007): The costs and potential savings associated with nursing home hospitalizations. Health Aff., 26: 1753–61.
6. Gurwitz, J.H., McLaughlin, T.J., Willison, D.J., Guadagnoli, E., Hauptman, P.J., Gao, X., et al. (1997): Delayed hospital presentation in patients who have had acute myocardial infarction. Ann Intern Med.126: 593–599. doi: 10.7326/0003-4819-126-8-199704150-00001
7. Hafez, G., Bagchi, K. and Mahaini, R. (2000): Caring for the elderly: a report on the status of care for the elderly in the Eastern Mediterranean Region. EMHJ, 6(4): 636-643.
8. Hung, C.L., Jia-Yin, H. C., Yeh, H. and Chang, W. (2010): Atypical chest pain in the elderly: prevalence, possible mechanisms, and prognosis. Internat J of Gerontology, 4(1): 1-8
9. Kelly, B.S. (2007): Evaluation of the Elderly Patient with Acute Chest Pain. Clin Geriatr Med., 23: 327–349
10. Kessler, C., Meredith, C., Williams, M.C., Moustoukas, J.N. and Pappas, C. (2013): Transitions of care for the geriatric patient in the emergency department. Clin Geriatr Med., 29: 49–69 http://dx.doi.org/10.1016/j.cger.2012.10.005
11. Levine, M.E. (2013): Modeling the rate of senescence: can estimated biological age predict mortality more accurately than chronological age? J Gerontol A Biol Sci Med Sci., 68(6): 667-674.
12. doi: 10.1093/gerona/gls233

13. Lionakis, N., Mendrinos, D., Sanidas. E., Favatas, G. and Georgopoulou, M. (2012): Hypertension in the elderly. World J Cardiol. 4(5): 135-147. doi:10.4330/wjc.v4.i5.135

14. McKeown, R.E. (2009): The epidemiologic transition: changing patterns of mortality and population dynamics. Am J Lifestyle Med., 3(1 Suppl): 19S–26S. doi:10.1177/1559827609335350.

15. Orimo, H., Ito, H., Suzuki, T., Araki, A., Hosoi, T. and Sawabe, M. (2006): Reviewing the definition of elderly. Geriatric Gerontal Int., 6: 149-158.

16. Silva, L. B., Soares, S.M., Silva, P.B., Santos J.G., Miranda L.V., Santos RM. (2018): Assessment of the quality of primary care for the elderly according to the Chronic Care Model. Rev. Latino-Am. Enfermagem. 2018; 26: e2987. Access on July 2018. www.eerp.usp.br/rlae   DOI: 10.1590/1518-8345.2331.2987

17. Singh, S. and Bajorek, B. (2014): Defining 'elderly' in clinical practice guidelines for pharmacotherapy. Pharmacy Practice, 12(4): 489.

18. World Health Organization (WHO). (2011): Global Health and Aging. National Institute on Aging. National Institutes of Health. NIH Publication no. 11-7737. October 2011.

19. World health organization (WHO). (2018): Health situation and trend assessment (elderly population). South-East Area Report (SEAR) 2018. Available at:

20. http://www.searo.who.int/entity/health_situation_trends/data/chi/elderly-population/en/

21. Williams, M.A., Fleg, J.L., Ades, P.A., Chaitman, B.R., Miller, N.H., Mohiuddin, S.M., et al. (2002): Secondary prevention of coronary heart disease in the elderly (With emphasis on patients >75 years of age). An American heart association, scientific statement from the council on clinical cardiology subcommittee on exercise, cardiac rehabilitation, and prevention. Circulation.105: 1735-1743.

22. Available at http://www.circulationaha.org

23. DOI: 10.1161/01.CIR.0000013074.73995.6C