Comparative Echocardiographic Changes between Healthy Young and Elderly Male that guide Rehabilitation Program

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ABSTRACT

Objectives: *The aim of this study was to give an overview of the normal Echo-& Doppler-Echocardiographic changes in healthy geriatric subjects, those might interfered in rehabilitation program have a decline in cardiopulmonary functions and fitness. However, improvement of such functions is a subject of considerable debate. Compare cardiac efficiency of young & elderly that may be useful in control of the group exercise therapy as well as geriatric cardiac rehabilitation programs to delineate the fundamentals of implementation of physical activity in both primary and secondary prevention of cardiovascular disease and provide guidelines for the physiotherapists working with elderly should not view them as being one homogeneous group.* ***Methods:*** *This is a clinical prospective study in which evaluation of the normal Echo-& Doppler-Echocardiographic changes in 40 healthy young and geriatric subjects was conducted. They were classified into two groups, young group (no. = 20) aged 22-29 years (mean 24 + 4.8 years) and geriatric group (no. = 20) aged 56-72 years (mean 64 + 2.4 years). They were investigated using Echocardiographic assessment together with pulsed Doppler-Echocardiography in addition to thoroughly clinical examination, chest X-ray, resting 12-lead ECG and routine laboratory test.* ***Results:*** *There was significant depressed systolic function parameters (LVEDd, LVESd, FS%, LVM, LVEDV, LVESV, SV, EF%, PEV, MAFVA) in geriatric group ($P<0.01$) compare to young group. Diastolic function parameters of the geriatric group were also significantly affected (E, A, E/A) where E was decreased ($P<0.05$), A was increased and hence E/A ratio was significantly decreased ($P<0.05$).* ***Conclusion:*** *These findings indicate that Echo and Doppler-Echocardiographic indices of left ventricular systolic and diastolic functions are altered elementary by aging. Thus the effect of aging should be considered on interpreting the Echocardiographic finding in elderly when the normal limits for Echocardiography and pulsed-Doppler-Echo indices of left ventricular systolic and diastolic functions are defined specially during group exercise therapy and rehabilitation programs in geriatric housing and centers that help to develop a heart-healthy exercise routine, adjust to a new lifestyle, return to a productive life, and cope with future health concerns.*
Key words: *Echocardiographic, young, elderly, rehabilitation.*

INTRODUCTION

Safety considerations are always a paramount concern with elder exercise programs. There are some unique challenges for the elderly with exercise prescription. This population is less adaptable to temperature changes; have a lower proportion of total body water, they are more susceptible to dehydration and more susceptible to cold injuries because of their decreased ability to perceive ambient air temperatures adequately and respond appropriately. This may be due to decreased muscle mass, loss of subcutaneous fat, inadequate vasoconstriction, or the affects of medications.

The risks of exercise in the aging population are more pronounced with individuals who have pre-existing cardiovascular disease or cardiac problems, chronic obstructive pulmonary disease (emphysema, asthma, chronic bronchitis), deleterious osteoporosis and arthritis, and uncontrolled metabolic problems (unmanaged diabetes), the most interesting part is an exercise prescription and the Question remains regarding training and changes in resting heart rate (HR) among older individuals[14].The impact of aging on the cardiovascular system has been the subject of considerable research since 1929 when described the decrease in work capacity of older individuals[19]. It is well established that resting systolic and diastolic blood pressure (SBP and DBP, respectively) increases as one ages[15].

The magnitude of change in resting and exercise heart rate (HR) and blood pressure (BP), by race, sex, and age, after training program in healthy and previously sedentary subjects were substantial and clinically important, with the older and the black populations experiencing greater reductions[22]. The age and gender differences in cardiovascular adaptation to a standardized/quantified training program will decrease resting and sub maximal heart rate in both younger and older adults. The significant increase in heart rate variability, total power, and high-frequency power in all groups after endurance training indicates that heart rate variability measurement appears to provide an effective, noninvasive assessment of cardiovascular adaptation to aerobic training[5].

While consensus does not exist, the great majority of studies have indicated that aging is associated with a decline in maximal oxygen uptake and cardiac output during exercise. Verily, despite extensive research in this area, it is uncertain whether this decline is related to changes in ventricular pump function or to changes in the peripheral vasculature of skeletal muscles[18].

The primary aging is characterized by a progressive decline in maximal aerobic exercise capacity generally attributed to the age-related alterations in the cardiovascular system, skeletal muscles, and life-style decline in habits[10]. Maximum cardiac output decreased with aging, this decrease has been attributed to a reduction in both maximum heart rate and stroke volume. The decrease in stroke with age may be due to higher systolic pressure, aortic impediment and intrinsic changes in myocardium[11].

Physical inactivity is a leading cause of preventable death and morbidity in developed countries. In addition physical activity can potentially be an effective treatment for various medical conditions (e.g. cardiovascular disease and osteoarthritis). Many types of physical activity programs exist ranging from simple home exercise programs to intense highly supervised hospital (center) based programs[2].

Alterations in the Doppler left ventricular diastolic waveform identified in their older subjects appeared to be qualitatively similar to, although not as severe as, those previously seen in patients with various cardiac impairment including coronary artery disease, systemic hypertension, aortic valve stenosis, and hypertrophic cardio-myopathy. The normal left ventricle becomes stiffer and diastolic filling is altered with aging. Aging is associated with an increased duration of isovolumic relaxation and reduced rate of decrease of flow velocity in early diastole[21].

This work was aiming to assess the normal Echo and Doppler- echocardiographic age related alterations that can be misdiagnosed as pathological cardiac changes in geriatric subjects and form a bases for evaluating them when group therapy are performed in geriatric centers and physical therapy clinics. This will help to develop a heart-healthy exercise routine, adjust to a new lifestyle, assist return to a productive life, and cope with future health concerns this spirited population.

The importance of the study coming as physiotherapist supervised exercise sessions tailored to elderly abilities and needs; monitor the vital signs, symptoms, and exercise responses and educational presentations on lifestyle changes that can reduce geriatric risk of future health problems. It is well-recognized that many deleterious physical and psychological conditions that commonly occur during aging can be prevented or delayed in asymptomatic persons with regular physical activity in elders that has been linked to playing a role in the prevention of some cancers as well as reduced risk to heart disease, hypertension, osteoporosis, obesity, type II diabetes, osteoarthritis and abnormal cholesterol.

MATERIAL AND METHODS

Subjects

Forty Saudi healthy males living in the Eastern Saudi Arabia (Dammam and Al-Khobar) included in this study and inclusion criteria accepted as follows:

1- Male in the age bracket of 22-72 years.
2- Free of symptoms & have no cardiopulmonary diseases.
3- Non-smoker.
4- Sedentary life style at least last year before the beginning of the study.
5- No history of hypertension or evidence of exercise induced ischemia.
6- Normal cardiovascular examination & resting 12-lead electrocardiogram.
7- Ethical committee permission was granted with subject written consent.

Every male participated in the study was assigned to one of the classified two groups:

- Young group (20) healthy male volunteers aged 22-29 years (mean 24+4.8 y); they were in a good health with normal examination and routine laboratory test.
- Geriatric group (20) healthy male volunteers aged 56-72 years (mean 64+2.4 y); they were in a good health with clinical examination and routine laboratory test.

Methods

All subjects were subjected to

1. Thoroughly clinical examination.
2. Routine laboratory test (fasting and postprandial blood sugar, urine & stool, complete blood picture, liver and renal function, resting ECG & X-ray chest.
3. Echocardiograpy: done with instrument using a 3.5 MHZ transducer, 1.5 cm in diameter focused at 7.5cm. all examinations were conducted in left lateral decubitus with trunk raised 30 degrees that enables left ventricle accurately recorded and serves to standardized values for cardiac dimensions and volumes to be interpreted consistently.
4. Doppler-Echocardiograpy: two-Dimensional images Doppler-Echo were obtained with an Aloka SSD 830 colored Doppler using a 3.5 MHZ transducer, 1.5 cm in diameter with combined pulsed Doppler flow analyzer with a 2.5 MHZ in line with 2-Dimensional wide angle (90) degrees phased array sector scanner with movable cursor & adjustable volume depth positioned any where (cross- ectional sector plane up to 17 cm depth). The depth obtained the left ventricular diastolic flow

velocity profiles ranged (9-13cm). Conventional pulsed Doppler Echocardiography of mitral flow was performed (apical 4-chamber view) at the level of the mitral annulus in the center of mitral flow. Transmitral flow velocities were measured at mitral annulus during early and late diastole using 3 consecutive beats. All data were recorded in video printer and analysis was totally automatic.

The following pulsed Doppler and Echocardiographic measurements were taken

(I) Diastolic Function Parameters

1. Magnitude of the early diastolic flow velocity peak (E).
2. Magnitude of the late diastolic flow velocity peak (A).
3. Ratio between the highest of the early diastolic flow-velocity peak, and late diastolic flow velocity peak (E/A ratio) which represent a Doppler measure of the relative contribution of early diastolic filling and atrial systole to overall left ventricular filling.

(II) Systolic Function Parameters

1. Left ventricular end diastolic dimensions (LVEDd).
2. Left ventricular end systolic dimensions (LVESd).
3. Fractional shortening percent (FS%).
4. Left ventricular mass (LVM).
5. Left ventricular end diastolic volume (LVEDV).
6. Left ventricular end systolic volume (LVESV).
7. Stroke volume (SV).
8. Ejection Fraction percent (EF%).
9. Peak flow velocity of the aortic valve flow (PFV).
10. Mean Aortic flow velocity acceleration (MAFVA).

RESULTS

Doppler-Echocardiographic changes in geriatric groups were represented in Table (1). The mean heart rate of the geriatric group was significantly higher ($P<0.01$) compared to the young group as shown in figure (2).

Meanwhile, the LVEDd, LVESd, FS%, LVM, LVEDV, LVESV, SV, EF%, PFV, MAFVA, of the young group were significantly higher ($P<0.01$) compared to the geriatric group as shown in figure (1 & 2).

The peak velocity of early mitral inflow was significantly higher ($P<0.05$) compared to the geriatric group. The peak late diastolic inflow of the geriatric group was significantly higher than the young group and hence the ratio of early to late diastolic inflow of the geriatric group were significantly less ($P<0.01$) compared to the young group as shown in figure (3) which represent a Doppler measure of the relative contribution of early diastolic filling and atrial systole to overall left ventricular filling.

Table (1): Comparison between young group and geriatric group for the Doppler Echocardiography

Parameter	Young group (20)		Geriatric group (20)		*t*-value	*P*-value
	Mean	SD±	Mean	SD±		
H.R.	61.5	7.8	76.9	3.4	4.8	P<0.01**
LVEDd	5.3	0.2	4.8	0.2	4.5	P<0.01**
LVESd	3.5	0.2	3.4	0.1	5.1	P<0.01**
FS%	34.7	2.9	31.2	1.7	6.4	P<0.01**
LVM	240.5	32.1	187.9	21.3	9.3	P<0.01**
LVEDv	142.2	12.9	114.3	12.5	4.3	P<0.01**
LVESv	51.4	5.6	45.3	5.7	7.4	P<0.01**
SV	91.2	11.5	69.1	7.8	6.1	P<0.01**
EF%	73.1	3.6	67.5	1.9	3.7	P<0.01**
PFV	95.4	2.7	85.5	2.3	3.5	P<0.01**
MAFVA	1.6	0.1	1.4	0.1	3.4	P<0.01**
E	2.8	0.3	2.4	0.4	1.8	P<0.05*
A	1.7	0.3	2.3	0.6	1.8	P<0.01*
E/A	1.8	0.4	1.2	0.3	4.3	P<0.05**

H.R. : Heart rate
LVEDd : Left ventricular end diastolic dimension.
LVESd : Left ventricular end systolic dimension.
FS% : Fractional shortening.
LVM : Left ventricular Mass.
LVEDv : Left ventricular end diastolic volume.
LVESv : Left ventricular end systolic volume.
SV : Stroke volume.
EF% : Ejection Fraction percent
E : Peak velocity of early mitral inflow.
A : Peak of late diastolic inflow.
E/A : Ratio of early to late diastolic inflow.
PFV : Peak flow velocity (Aortic)
MAFVA : Mean aortic flow velocity acceleration.
* : Significant.
** : Highly significant.

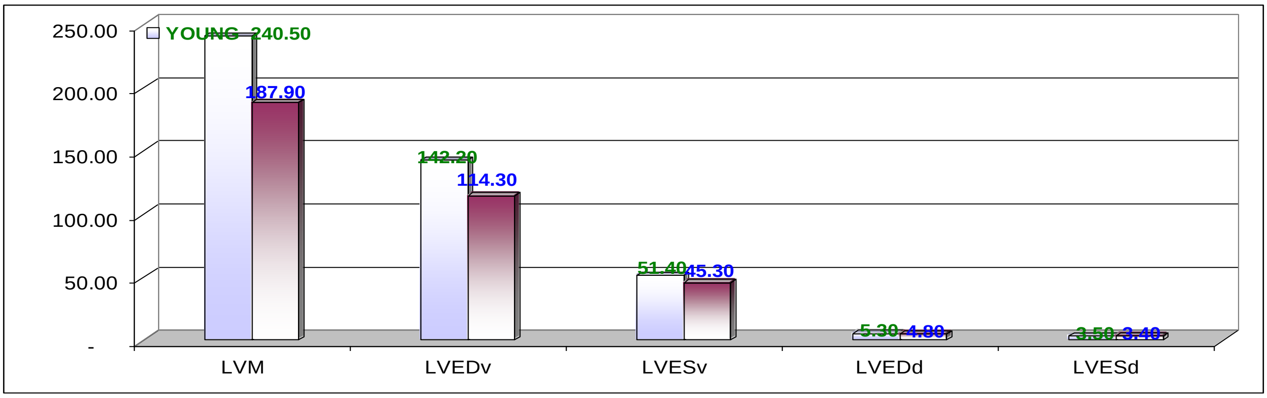

Fig. (1): Shows comparison between mean values of young and geriatric groups for the Doppler Left ventricular Mass (LVM), Left ventricular end diastolic volume (LVEDv), Left ventricular end systolic volume (LVESv), Left ventricular end diastolic dimension (LVEDd) and Left ventricular end systolic dimension (LVESd).

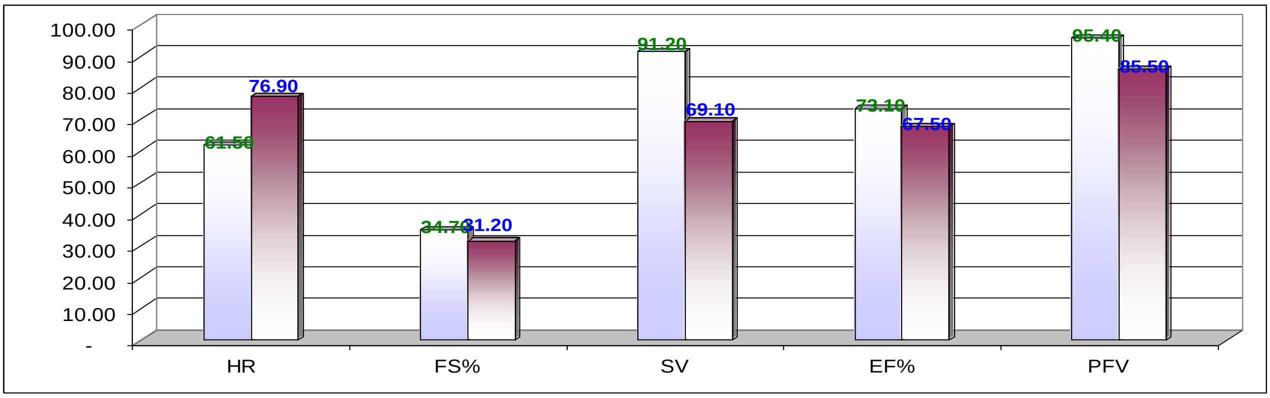

Fig. (2): Shows comparison between mean values of young and geriatric groups for the Doppler Heart rate (HR), Fractional shortening percent (FS %), Stroke volume (SV), Ejection Fraction percent (EF %) and Peak flow velocity of the aorta (PFV).

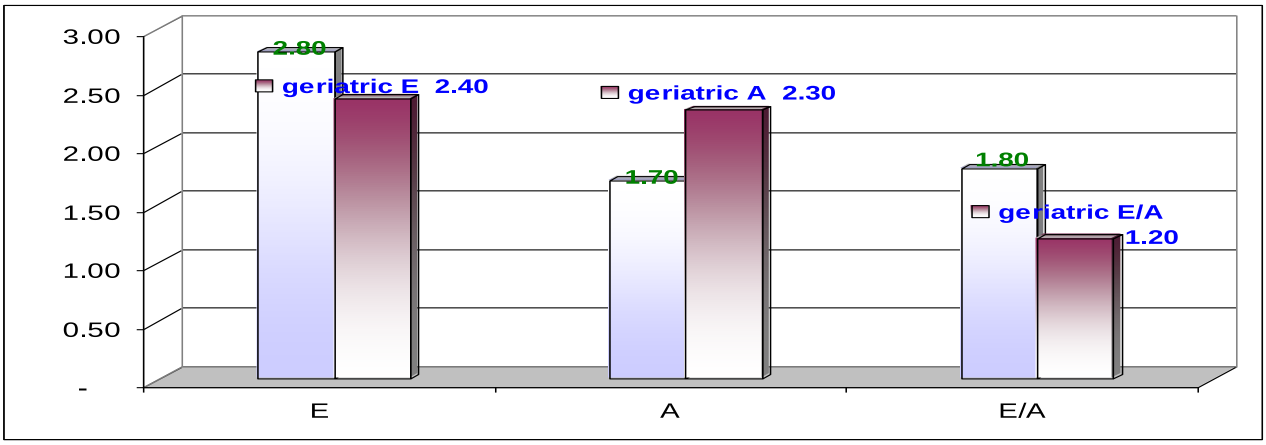

Fig. (3): Shows comparison between mean values of young and geriatric groups for the Doppler magnitude of the early diastolic flow velocity peak (E), magnitude of the late diastolic flow velocity peak (A) and ratio between the highest of the early diastolic flow-velocity peak, and late diastolic flow velocity peak (E/A ratio).

DISCUSSION

Advances in Echocardiography and pulsed Doppler-Echocardiogrpahy have made possible nonabrasive assessment of cardiac dimensions and volumes beside that of mitral inflow in a variety of conditions. More recently, data obtained from the Doppler diastolic flow velocity waveform also indicate that the filling patterns of the left ventricle may be influenced by aging[4]. Aging is an effective stimulus in shaping left ventricular structure and function in the older hearts[9].

Some authors reported that hemodynamic data obtained in small numbers of people without heart disease have suggested that the normal left ventricle becomes stiffer and diastolic filling is altered with aging[21]. Training induced adaptation may have protective benefits for cardiovascular aging. Longer exercise training, may be needed for older individuals to be more effective in terms of resting HR reduction[14].

In the present work, the resting heart rate was significantly higher (P <0.01) in the geriatric group compared to the young group. This finding is in agreement with others reported a statistically significant increase in HR in older subjects[13]. This was explained due to significant reduction in myocardial contractility as well as increased peripheral resistance[10].

1- Echocardiogrphic parameters

The systolic function parameters: As regard LVEDd in the present study, it was significantly higher in young group compared to geriatric group. Similar to results were obtained by others[1,12] found a linear relationship between the end-diastolic dimension and HR, while someone reported significant reduction of LVEDd in old subjects and claimed this increase in LVEDd in the young group to the significant lower heart rate[7]. This data indicated that a 10 beat/min change in HR induced by cardiac pacing would only be associated with 2.7% change in LVEDd, other came to the conclusion that the dilated LVEDd of the younger group increase their functional capacity[3].

As regards LVESd, the young group showed a statistically significant increase in LVESd (P<0.01) compared to the geriatric group. The results of the present study go with the findings reported significant reduction of LVESd in older subjects[1]6. They required it to the alterations of the primary intrinsic properties of the cardiac muscle (that is the left ventricular relaxation and elastic properties of the ventricle).

In the present study the FS% was significantly higher in the young group compared to the geriatric coup. Similar results were obtained by they reported significant reduction of FS% with advancing age[10,16,18]. They claimed this change to the decreased myocardial contractility as well as increased peripheral resistance with advanced age.

Left ventricular mass (LVM) of the geriatric group showed a significant reduction comparing to the young group. Our results were in agreement with that of Mann who reported significant reduction in LVM with age[18]. The significant reduction of LVM in older subjects by the decrease in LVEDd and posterior wall thickness and inter ventricular septal thickness with age was also explained[6].

As regards LVEDV and LVESV, the geriatric group showed a significantly lower compared to the younger group. Significant reduction in LVEDV and LVESV in older subjects was reported due mainly to reduction in left ventricular volumes to the reduced left ventricular dimensions (LVEDd, LVESd) rather than functional changes[10].

As regards stroke volume (SV) the young group showed a significantly higher compared to the geriatric group. The same results obtained by reported significant reduction in (SV) with age[10,12]. They claimed that reduction to the increased LVEDV, and higher systolic blood pressure of the old subjects as well as the increased aortic impedance.

Regarding ejection fraction percent (EF%), the geriatric group showed a significantly less (EF%). The results go with the findings of reported significant reduction of (EF%) in old subjects[16,18,20]. They claimed that reduction to the higher percents of age predicted maximal heart rate in older subjects and to the left ventricular dimensional changes rather than functional adaptation.

As regarding the peak flow-velocity (PFV) and the mean aortic flow-velocity acceleration (MAFVA), the younger group showed a significantly higher compared to the geriatric group. These results are in good agreement with who reported significant reduction of PFV and MAFVA of normal old subjects[12]. They claimed that reduction to the increased systolic blood pressure, increased peripheral resistance and the reduced contractility.

2- Doppler-Echocardiographic Parameters

The diastolic function parameters: In the Present work, the peak velocity of early mitral inflow (E) and ratio of early to late diastolic inflow (E/A) showed a significant reduction in the geriatric group compared to the young group. The peak velocity of the late mitral inflow (A) of the geriatric group was significantly higher than the young group.

Similar to our results were that obtained by reported a significant reduction of the Doppler diastolic indices of the left ventricular diabolic function including (E) and (E/A) in older subjects[4,5,21]. They attributed that reduction to the age related alterations in the left ventricular diastolic function, and that aging is associated with increased duration of isovolumic relaxation and a reduced rate of decrease (deceleration) of flow velocity in early diastole.

In addition, maximal early diastolic flow velocity decreased and late diastolic flow velocity (largely owing to atrial systole and increased reliance of left ventricular filling on atrial contraction) increased linearly with age early and hence the ratio between early and late diastolic flow velocity was significantly lower in older subject.

Significant increase in resting (A) and decreased (E/A) in resting elderly subjects. They attributed to the increase in the resting HR and the increased systolic blood pressure. They found that even modest change in HR altered peak and integrated (A) tilling velocity, as (A) filling is increased as HR is elevated[17].

In conclusion, our findings indicate that the Echocardiographic and Doppler indices of left ventricular systolic and diastolic function is altered substantially by aging, and that age is an independent determinant of most indices of left ventricular diastolic flow velocity.

Thus the effect of age should be considered when the normal limits for Echocardiographic and pulsed Doppler-Echocardiography indices of left ventricular systolic and diastolic function are defined when group exercise therapy are performed in geriatric centers or physical therapy clinics. This study supports the efficacy of aerobic exercise for reducing resting SBP in older adults. However, a need exists for studies that address the effectiveness of this intervention for reducing resting BP in older adults[15].

Our results suggest that moderate intensity resistance training is not contraindicated and could become part of the non-pharmacological intervention strategy to prevent and combat high blood pressure. However, additional studies are needed, especially in the hypertensive population[5]. Although health-related benefits of fitness training in elderly are well established, it is not clear yet which mode and intensity of a exercise program is most effective[21] that determine the physiological effects of a programmed accommodating circuit exercise (PACE) program consisting of aerobic exercise and hydraulic-resistance exercise (HRE) on fitness in older adults[22]. This will enhance and promote age related alterations that can be misdiagnosed as abnormal or pathological cardiac changes in geriatric subjects and form bases for evaluating them when group exercise therapy or programs are performed in geriatric centers and physical therapy clinics.

REFERENCES

1. Adames, K.F., Imwrence Vincent; Susan, M.,

and Hesham El-Ashmawy: The influence of age and gender on left ventricular response to supine exercise in asymptomatic normal subjects. Am.H.J. vol. 113: 732-742, 1987.

2. Ashworth, N.L., Chad, K.E., Harrison, E.L., Reeder, B.A. and Marshall, S.C.: Home versus center based physical activity programs in older adults. Cochrane Database Syst Rev. 25(1): CD004017, 2005.
3. Bar Shlomo, B.Z.B.: Left ventricular function in gained and untrained normal subjects. Circulation. 6: 484-494, 1989.
4. Bryg, R.J., George Williams and Arthur, J. Labovitz: Effect of aging on left ventricular diastolic filling in normal subjects. Am. J. Card. 59: 971-979, 1997.
5. Carter, J.B., Banister, E.W. and Blabber, A.P.: The effect of age and gender on heart rate variability after endurance training. Med Sci Sports Exerc; 35(8): 1333-1340, 2003.
6. chandrashekhar, K. and Anand, L.S.: Exercise as a coronary protective factor. Am. H.J. 122: 1713-1739, 1997.
7. Cornelissen, V.A. and Fagard, R.H.: Effect of resistance training on resting blood pressure: a meta-analysis of randomized controlled trials. J Hypertens. 23(2): 251-259, 2005.
8. Delecluse, C., Colman, V., Roelants, M., Verschueren, S., Derave, W., Ceux, T., Eijnde, B.O., Seghers, J., Pardaens, K., Brumagne, S., Goris, M., Buekers, M., Spaepen, A., Swinnen, S. and Stijnen, V.: Exercise programs for older men: mode and intensity to induce the highest possible health-related benefits. Prev Med. 39(4): 823-833, 2004.
9. Douglas, P.S. and Mary, O.: Aging and physical activity determine cardiac structure and function in the older athletes. App. Phys. 72: 1969-1973, 1992.
10. Ehsani, A.E., Takeshi Ogawa, Tom R. Miller and Sara Mjilka: Systolic function in older men.Circul. 83: 96-103, 1998.
11. Heath, G.W., Hagrerg, F.M., Ali Ehsani and Holloszy, F.O.: A physiological comparison of young and older endurance athletes. J. App. Phys. 51: 634-440, 1988.
12. Henry, W.L., Julius, M.G. Grdin and James Wire: Echocardiographic measurements in normal subjects from infancy to old age.Circul 62: 1954-1961, 1998.
13. Higginbotham, M.B., Kenneth, G., Sanders William and Freddy Cobb: Physiological basis for the age related decline in Aerobic work capacity. Am. J. Card. 57: 1374-1379, 1986.
14. Huang, G., Shi, X., Davis-Brezette, J.A. and Osness, W.H.: Resting heart rate changes after endurance training in older adults: a meta-analysis. Med Sci Sports Exerc; 37(8): 1381-1386, 2005.
15. Kelley, G.A. and Sharpe Kelley, K.: Aerobic exercise and resting blood pressure in older adults: a meta-analytic review of randomized controlled trials. J Gerontol A Biol Sci Med Sci. May; 56(5): M298-303, 2003.
16. Kreulen, T.Q., Alfred bare; Micheal Mc Donald and James Spann: The evaluation of left ventricular function in man. A comparison of methods. Circul. 51: 677-688, 1995.
17. Mac-Faralan, N., Northridye, B., Grand, G. and Darige, H.: A comparative study of left ventricular structure and function in elite athlete.Br. Spells Med. 25: 45-48, 2002.
18. Mann, D.L., balm Demenber, Arnold Cash, P. Todd Andxlfoed, A.: Effects of age on ventricular performance during graded exercise. Am. H.J. 111: 108-115, 1999.
19. Master, A.M. and Oppernheimer: A simple exercise tolerance test for circulatory efficiency with standard table for normal individuals, 1999.
20. Schairer, J.R., Paul Stein, Steve Ketejian and Tracy Shaw: Left ventricular response to submaximal exercise in Endurance trained athletes and sedentary adults, 1992.
21. Spirito, P. and Maron, B.: Influence of aging on Doppler-echocardiographic indices of left ventricular diastolic function. Br.H.J. 59: 672-679, 1987.
22. Wilmore, J.H., Stanforth, P.R., Gagnon, J., Rice, T., Mandel, S., Leon, A.S., Rao, D.C., Skinner, J.S. and Bouchard, C.: Heart rate and blood pressure changes with endurance training: the HERITAGE Family Study. Med Sci Sports Exerc; 33(1): 107-116, 2001.

الملخص العربى

مقارنة التغييرات القلبية باستخدام الموجات فوق الصوتية بين الرجال الأصحاء متوسطى العمر و المسنين والتى توشد أخصائى العلاج الطبيعى فى وضع برامج التأهيل

الهدف من البحث: أجرى هذا البحث لدراسة مقارنة التغيرات القلبية باستخدام الموجات فوق الصوتية بين الرجال الأصحاء متوسطى العمر و المسنين لمعرفة التغيرات الفسيولوجية فى عضلة القلب مع التقدم فى العمر والمرتبطة بالسن والتى قد تتشابة مع بعض التغيرات المرضية التى تصيب القلب وايجاد الفرق بينهما وما يتبع ذلك من الايضاح والارشاد عند وضع برامج التأهيل للمسنين ووضع ذلك فى الحسبان مع الأخذ بالفروق الفردية المختلفة. **مواد وأساليب البحث :** أشترك في هذه الدراسة أربعون (40) رجلا من الاصحاء تتراوح أعمارهم بين 22-72 عاما ، تم تقسيمهم الى مجموعتين : مجموعة من الاصحاء متوسطى العمر تتكون من 20 رجلا تتراوح أعمارهم بين 22-29 عاما بمتوسط 4.8 + 24 والاخرى من الاصحاء المسنين تتكون من 20 رجلا تتراوح أعمارهم بين 56-72 عاما بمتوسط 2.4 + 64 ، أجرى لهم الفحص الاكلينيكى السريرى الشامل و الاختبارات المعملية الاتية (سكر صائم و بعد الاكل ، تحليل بول و براز ، وظائف كلى و كبد ، أشعة عادية على الصدر ، ورسم القلب بدون مجهود) بالاضافة الى تقييم عضلة القلب أثناء الانقباض و الانبساط بجهاز الدوبلر و كذا الموجات فوق الصوتية . **وقد أظهرت النتائج مايلى :** أن هناك انخفاض واضح ذو دلالة احصائية فى وظائف القلب أثناء الانقباض و الانبساط لدى مجموعة المسنين بالمقارنة بمجموعة متوسطى العمر، بينما كان هناك ارتفاع بمعدل ضربات القلب لدى المسنين واضح وذو دلالة احصائية. **خاتمة :** توضح هذه النتائج أهمية و ضرورة تحديد التغيرات التى تحدث فى عضلة القلب لدى كبار السن والتى لابد أن تؤخذ فى الاعتبار و لايساء تفسيرها على أنها علامات مرضية أصابت القلب وذلك أثناء وضع برامج تأهيل المسنين أو تقييم عمل المجموعات أثناء التمرينات العلاجية أو التدريبات التأهيلية فى مراكز التأهيل و دور المسنين و كذا مراكز العلاج الطبيعى.