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Original Research Article

To study the base line data and correlation between physiological parameters and aging (age 65 and above)

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Abstract

Background & Methods: The aim of the study is to study the base line data and correlation between physiological parameters and aging (age 65 and above). Palpatory method (mmHg) and Auscultory method (mmHg). Systolic and diastolic blood pressure, Mean Atrial Pressure and pulse pressure shall be recorded in mm of Hg by using sphygmomanometer and stethoscope.

Results: The mean value forced expiratory volume in first second was 1.94±0.59. The ratio of forced expiratory volume in first second and forced vital capacity was 82.61 ±9.57.

Conclusion: Cardiovascular parameter that SBP, DBP, PP, MAP shows significant correlation with age but heart rate was not significant. Obesity is an important risk factor for cardiovascular disease. Blood pressure at each age is generally regarded as the single most reliable predictor of blood pressure at a later age. Exercise and training may be responsible for age related decreases in maximum heart rate and arteriovenous oxygen difference. The outcome of present study of respiratory parameter shows that FEV1 / FVC is negativity correlated with age and also shows non- significant changes. Age is associated with decline in FEV 1 and FVC in an elderly population. Age was the strongest negative correlation of FEV1/FVC ratio with pulmonary function. It shows that lung function significantly decline with age.

Keywords: correlation, physiological & aging.

Study Design: Observational Study.

Introduction

Pulmonary function tests are vital within the prognosis of pulmonary disease but additionally in assessing the impact of drug and follow up of the disease diagnosis[1]. Important variables affecting the standards for ventilatory characteristic include age, height, sex, size of the sample tested, racial and ethnic composition, criteria for normality, tobacco smoking, environmental situations and altitude of residence, apparatus and techniques. Ventilatory function tests provide a better result of functional changes in the lungs and their significance from the view point of diagnosis[2].

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Pulmonary function tests are very helpful in the diagnosis, management and follow up of respiratory disorders, yet they have not gained the required popularity and place in the diagnostic armamentarium of respiratory disease[3]. Pulmonary function tests are affected by many factors like, age, sex, height and race and body surface area of the individuals. Few studies have been conducted by Indian workers to established norms of pulmonary function tests in healthy adults. Since the pulmonary function tests are affected in one way or other in most of the pulmonary diseases clinicians must know the pulmonary function tests in order to arrive at an accurate diagnosis[4]. Pulmonary function test provide objective evidences of the nature and severity of lung disease. Pulmonary function tests are important not only in the diagnosis of pulmonary diseases but also in assessing the effect of drug and follow up of the disease prognosis. Even within the country ventilatory function of the lung show wide variation in people having similar socioeconomic environment but belonging to different regional areas and ethnic status. Changes in chest wall compliance lead to a greater contribution to breathing from the diaphragm and abdominal muscles and a lesser contribution from thoracic muscles[5-7].

Presbycusis, or age-related hearing loss (ARHL) is polygenic/multi factorial in aetiology. ARHL is thought to result from age-related degeneration of the cochlea with the cumulative effects of extrinsic damage and intrinsic disorders. ARHL is a complex disorder, influenced by genetic, environmental/lifestyle and stochastic factors. Despite its high prevalence and the recent progress in hearing research, few attempts to identify genetic determinants of ARHL have been made [8-10]. The principal treatment for age-related hearing loss at present is with suitable amplification that provides appropriate gain at selective frequencies, compression of high-level signals, and attenuation of background noise through adaptive filtering and directional microphones.

Material and Methods

The present observational study was conducted at Amaltas Institute of Medical Sciences, Dewas, M.P. under taken on 65 years age and above. In Indian context person having age more than 60 years is concluded old. It coincides with age of retirement in Government sector. Revised age of retirement is now 62 years. But most developed world countries have accepted the chronological age of 65 years as a definition of “elderly” or “older person”. So we have preferred to take our study subjects of > 65 years age. Total number of subjects for study will be 100 with equal number of both genders. This number is statistically significant to arrive at a conclusion. We shall measure the health status of elderly aging.

INCLUSION CRITERIA:

Aged population 65 and above, clinically fit and with symptoms, signs related to frailty that is weight loss, weakness, slow walking speed, low level of activity and feeling of fatigue.

65 and above individuals on medication for idiopathic hypertension, visual and hearing deficits, bronchial asthma, diabetes mellitus but well controlled with medication and clinically healthy.

EXCLUSION CRITERIA:

All the subjects 65 and above, with sign and symptoms because of disease, on medication but clinically not healthy.

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Result

Table No. 1: Mean & SD of SBP, DBP, Pulse pressure, MAP, Heart Rate

Parameter	Mean	Std. Deviation	P Value
SBP	127.02	12.554	< .00001
DBP	81.84	7.535	
Pulse pressure	43.48	10.593	
MAP	96.275	8.131	
Heart Rate	74.74	7.181	

The chi-square statistic is 30.2528. The *p*-value is < .00001. The result is significant at $p < .05$.

Table shows descriptive statistics details of cardiovascular parameter. The parameters are Systolic Blood Pressure, Diastolic Blood Pressure, pulse pressure, mean arterial pressure and heart rate.
The mean systolic blood pressure was 127.02±13.55
The mean diastolic pressure was 81.84±8.53
The mean pulse pressure was 43.48±11.59
The mean arterial pressure was 96.27±9.13
The mean heart rate was 74.74±8.18

Table No. 2: Mean & SD of FVC, FEV1& FEV1/FVC

Parameter	Mean	Std. Deviation	P Value
FVC	3.32	2.733	.046813
FEV1	1.94	0.598	
FEV1/FVC	82.61	9.572	

The chi-square statistic is 3.0424. The *p*-value is .046813. The result is significant at $p < .05$.

The mean value forced expiratory volume in first second was 1.94±0.59. The ratio of forced expiratory volume in first second and forced vital capacity was 82.61 ±9.57.

Table No. 3: MUSCLE GRADING

Parameter	Grade	No.	Percentage	P Value
Muscle Grading	2	19	19	.002738
	3	21	21	
	4	46	46	
	5	14	14	

The chi-square statistic is 8.9744. The *p*-value is .002738. The result is significant at $p < .05$.

The grading of a skeletal muscle (grade 0-5) and percentage with frequency distribution of muscle where grade 2 was 19%, grade 3 was 21%, grade 4 was 46%, grade 5 was 14% out of 100 number of older subjects.

Table No. 4: Mean & SD of KCAL, BMR &BMI

Parameter	Mean	Std. Deviation	P Value
CALORIC INTAKE	2117.78	141.005	.070401
BMR	1247.94	106.831	

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BMI	19.52	2.586	

The chi-square statistic is 1.769. The *p*-value is .070401. The result is *not* significant at $p < .05$.

The descriptive statistics of nutritional parameters that is basal metabolic rate, body mass index and caloric intake. The mean value of caloric intake was 2117.78±141.00 The mean value of basal metabolic rate was 1247.94±106.83 The mean value of body mass index was 19.52±2.58

Discussion

This study is also similar with a study conducted by Laurence Fluckiger, Jean – Marc- Boivin, et al. those who reported that there was short term heart rate variability is impaired whereas Blood pressure variability is little affected by the aging process subject with normal blood pressure[11]. This study also shows continuous negative correlation between age and spectral component of heart rate variability. The result suggests that the sympathetic and vagal components of heart rate are equally affected by aging.

In our study the Mean and Std. Deviation of Forced Vital Capacity (FVC) was 3.32 ± 0.73, forced vital capacity in first second (FEV1) was 1.94 ± 0.59 and their ratio FEV1 / FVC was 82.61 ± 9.57[12].

In this study a positive correlation was found between respiratory parameters FEV1, FVC with age, whereas FEV1/FVC ratio is negatively correlated with age. The respiratory parameter like FVC, FEV1 and their ratio FEV1 / FVC was not significant with increased age[13].

These findings are similar to those of Milne JS, Williamson J. et.al. According to their study there was no age related decline in FEV1 or FVC among men, and only a slight decline among women occurs. Our study is also similar with a study conducted by Woo J, Pang J. et al. those who reported that there was no age related decline in FVC and FEV1 in males aged 60 years and above. These finding is different from those of Burr et.al. They described that environmental factors such as smoking and air pollution affect lung function, and differences in exposure to such factors may contribute to differences in Spiro metric values[14-16].

The opposite aspect of study by Bala S, Dhar RJK and Sachdev S. et al found a positive correlation between all the (FVC,FEV1,FEV3,PEFR)parameters with age and height in male and female subjects. Similarly, Krishna et.al found positive correlation of FVC,FEV1,with age ,height and BMI. The correlation of vital capacity with age was highly significant in case of both male and female whereas the correlation with height, weight and BSA not significant. J.Pathak et.al in their study “Pulmonary functions of elderly Indian subjects “concluded a declining pattern of vital capacity with age but the decline was not uniform[17-18].

Conclusion

In our study the cardiovascular parameter that SBP, DBP, PP, MAP shows significant correlation with age but heart rate was not significant. Obesity is an important risk factor for cardiovascular disease. Blood pressure at each age is generally regarded as the single most reliable predictor of blood pressure at a later age. Exercise and training may be responsible for age related decreases in maximum heart rate and arteriovenous oxygen difference. The outcome of present study of respiratory parameter shows that FEV1 / FVC is negativity correlated with age and also shows non- significant changes. Age is associated with decline in

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FEV 1 and FVC in an elderly population. Age was the strongest negative correlation of FEV1/FVC ratio with pulmonary function. It shows that lung function significantly decline with age.

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