9 STUDY OF PR INTERVAL IN FEMALES OF DIFFERENT AGE GROUPS

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ABSTRACT:

INTRODUCTION: PR interval is the interval between the onset of P wave and the onset of QRS complex. The normal PR interval is in the range of 0.12-0.28 sec Prolonged PR interval may be due to delayed conduction from atria to ventricles. Sometimes prolonged PR interval is seen in clinically healthy patients. In females till menopause the blood pressure is less than males of same age group due to protection by oestrogen. Aftermenopause risk of hypertension and also heart diseases increases. Again increasing age itself is responsible for degenerative changes in body. So this study was done for variation in PR interval in females with increasing age.

AIM & OBJECTIVE: To study PR interval variations in females of different age groups.

MATERIAL & METHOD: Females of different age from 20 years to 80 years were studied.ECG in lead II was recorded using Power lab 8/30 series. Mean standard deviation & proportion was used to present the data. Students't' test was done. Pearson's correlation coefficient 'r' was used to examine relationship between ECG changes with difference age groups. A two tailed p-value less than 0.05 will be considered as significant.

RESULTS: Prolongation of PR interval with increasing age

CONCLUSION: Although clinically healthy, females with prolonged PR interval must be advised regular follow up to detect early cardiac insufficiency.

KEY WORDS: PR interval, ECG, Females, Age

INTRODUCTION: The time between the beginning of the P wave and the beginning of QRS complex is PR interval. It indicates the interval between the electrical excitation of the atria and the beginning of electrical excitation of the ventricles.[1]when there is tachycardia PR interval usually decreases in length and with bradycardia PR interval increases. PR interval more than 0.20 sec is said to be prolonged PR interval. Patients with PR interval more than 0.20 sec are considered to have first degree heart block. In first degree heart block PR interval is prolonged up to 0.30 sec. The first degree heart block is due to delay of conduction from atria to ventricles but blockage of conduction is not seen. When PR interval increases above 0.35 sec to 0.45 seconds, conduction through the AV bundles is severely depressed and conduction stops entirely. Thus PR interval is very useful parameter to determine severity of heart disease.[2] Changes in conduction, voltage, and electrical axis may be seen in the aged person due to aging process. The age related electrocardiographic changes may also be due to coronary artery diseases. Also incidence of heart disease increases with age. In females after menopause risk of hypertension and therefore risk of cardiovascular diseases

increases due to loss of protection by oestrogen hormone. Therefore we studied PR interval in females of different age groups to find out variations in PR interval with increasing age of females.

MATERIAL & METHOD: The study was done in Jan 2012 to Dec 2012, at department of Physiology Navodaya Medical College Raichur, Karnataka, India. The healthy females of different age groups were included in the study. The subjects were recruited from general population in and around Raichur. Ethical clearance was obtained from the Navodaya Medical College Ethical Committee for Human Research to conduct the study. Written consent was obtained from the participants after explaining them the purpose of the study and details of the procedure.Healthy females in the age group 21 to 80 years were included in the study.H/O any systemic diseases like Hypertension, Heart diseases, Diabetes mellitus and H/O Smoking, alcohol consumption and medication. 75 female subjects who satisfied the inclusion and exclusion criteria were recruited. All the subjects were divided into different subgroups according to their age, Group I: 21 – 40 years (25), Group II: 41 – 60 years (25), Group III: 61 – 80 years (25). For all the subjects a detailed history followed by clinical examination was carried. Blood pressure was recorded in supine position after relaxing for 5 minutes. The subjects were asked to take rest for 10 minutes. Then Lead II ECG was recorded on all subjects in supine position in an ambient temperature for 3 minutes by using Power lab 8/30 series with dual bio amplifier (Manufactured by AD instruments, Australia with model no ML870). And the analysis of the ECG was done by the software in the same instrument. Descriptive statistics such as mean standard deviation and proportion was used to present the data. Students't' test for parametric data was used for comparison between groups. Pearson's correlation coefficient 'r' was used to examine relationship between ECG changes with difference age groups. A two tailed p-value less than 0.05 will be considered as significant[3,4,5]

RESULTS:

Table 1: Comparison of blood pressure between females of different age group

Parameters	**Group I**	**Group II**	**Group III**	**Post hoc multiple Comparison**
Mean SBP (mm of Hg)	115.8 ± 6.2	120.8 ± 9.6	129.7 ± 13.4	Gr I vs II, p>0.05 Gr I vs III, p<0.001* Gr II vs III, p<0.001*
Mean DBP (mm of Hg)	74.6 ± 6.3	79.04 ± 5.7	81.04 ± 5.75	Gr I vs II, p<0.05 Gr I vs III, p<0.001 Gr II vs III, p>0.05

***** Statistically significant

There was statistically significant difference in SBP when compared between group I and III and between group II and III. There was statistically significant difference in DBP when compared between group I and II and between group I and III.

Table 2: Comparison of PR interval between females of different age groups

Parameters	Group I	Group II	Group III	Post hoc multiple Comparison
Mean PR Interval (s)	0.13 ± 0.06	0.14 ± 0.04	0.15 ± 0.03	Gr I vs II, p>0.05 Gr I vs III, p>0.05 Gr II vs III, p>0.05

***** Statistically significant

PR interval was within normal range in all the age groups. There was prolongation of PR interval with increase in age. But this prolongation was statistically insignificant.

DISCUSSION: Aging is natural Physiological process. As age advances degenerative changes start in body affecting all systems. Blood pressure increases progressively as age increases. Systolic blood pressure increases more than diastolic blood pressure during middle adult years. Systolic blood pressure continues to increase till age of 80 years to 90 years. Diastolic blood pressure may remain constant or it may decrease after age of 50 years to sixty years. This leads to rise in pulse pressure progressively with age and the rate of rise is more after age 50 years [6,7,8]The fall in DBP seen after age 60 years is due to increased large artery stiffness [9-14] . Age-related stiffening of the aorta leads to decreased capacity of the elastic reservoir and also leads to greater peripheral runoff of stroke volume during systole. Therefore less blood is remaining in the aorta at the beginning of diastole, and with diminished elastic recoil, diastolic pressure decreases with increased steepness of diastolic decay [15]. Gender related difference is seen in blood pressure trends. In females rise in blood pressure starts lower than in males and after 60 years age blood pressure becomes slightly higher in females than males. The increase in blood pressure with age is mostly associated with structural changes in the arteries and especially with large artery stiffness [6,7,8]. In our study there was increase in both SBP and DBP with increasing age of females and the increase was less in older age group compared to younger ones. The diagnostic accuracy of ECG to differentiate between 'Normal' and 'Abnormal' depends on analysis of distribution in 'Normal', i.e. clinically healthy, population [16]. Age is biologically most important variable. ECG parameters may show variations according to changes in age. In some of the studies a small but significant increase in PR interval with age is seen[17,]but in some studies it is not seen [18]. In the study done by Datey and Bharucha , there was no change in PR Interval in any of the electrocardiographic leads[19].But many studies have shown a small increase in PR interval in aged person in different leads without any obvious clinical significance. Prolongation of PR interval indicates prolonged A-V conduction with A-V nodal block [20]. Recent studies showed that conduction of A-V node is accelerated resulting in decreased PR interval in ischemia[NR21]. Prolongation of PR interval is also now found to be associated with thyrotoxic periodic paralysis[22.]In our

study we have noted a small increase in PR interval (within normal range) with increasing age of females. But this prolongation was statistically insignificant.

CONCLUSION: Due to degenerative changes with increasing age, arteries become stiff leading to myocardial insufficiency. Also after menopause females are more prone for hypertension and cardiovascular diseases. Therefore although clinically normal, the females with prolonged PR interval should be advised regular follow up to detect early cardiovascular insufficiency or any other cause.

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