A COMPARATIVE STUDY TO ASSESS THE ACUTE EFFECT OF MUSIC AND NOISE ON HEART RATE VARIABILITY IN YOUNG HEALTHY ADULTS.

ABSTRACT

INTRODUCTION:

Sound stimulations not only influence the auditory system, but also influence the autonomic nervous systems, endocrine and circulatory system. Music and noise can cause changes in the various system, because it is also one of the sound stimulations. Though both are sounds, they are perceived in different way. The present study tries to establish a knowledge regarding, how classical music, rock music and white noise influence the cardiac autonomic activity by using spectral analysis of Heart Rate Variability[HRV]. HRV is considered as a standard, non-invasive tool used to measure autonomic dysfunction.

AIM & OBJECTIVES:

To assess the effect of classical music, rock music and white noise on heart rate variability in young healthy adults .

MATERIAL & METHODOLOGY:

This cross sectional study was conducted in the Department of physiology at Coimbatore Medical College, Coimbatore. A total of 100 healthy young adolescents of both 50 males and 50 females in the age group of 19-22 years were included in the study. Subject was asked not to eat heavy meals, ingest coffee, alcohol and not to exercise four hours before the procedure. After taking informed consent, normal parameters were recorded. Following which a 5 minutes lead II ECG was acquired and digitized at rate of 1000 samples per second. Results were tabulated and analysed by ANOVA. Inter group comparison done by Bonferroni post-Hoc test.

RESULTS:

Study result shows that lower levels of Low Frequency[LF] values, LF normalized unit[LF nu] and Low frequency high frequency ratio[LF/HF] and higher values of HFnu value after exposure to classical music, this reflect decreased sympathetic activity. Exposure to rock

music causes moderate rise in LFnu, LF/HF value reflect increased activity of sympathetic system. Exposure to white noise markedly increases sympathetic activity which is reflected by marked rise in LFnu, LF/HF values.

LF in ms^2 and normalized unit levels, LF/HF ratio levels between basal versus white noise, rock music versus white noise and classical music versus white noise was statistically significant[p value <0.05]. HF normalized unit levels, RMSSD levels between basal versus white noise, rock music versus white noise and classical music versus white noise was statistically significant[p<0.05].

DISCUSSION:

The cardiac autonomic responses observed in the present study during exposure to music and noise may be explained by physiological mechanisms associated with the brain. Pleasure experienced when listening to music is related to dopamine activity in the mesolimbic reward system. Listening to rock music stimulate Rostral ventro lateral medulla, in turn enhancing the sympathetic activity. White noise increases sympathetic system via acoustic startle reflex. Same mechanism explained in Roque Al et al, Plassa OB et al, Valent VE et al, Sim CS et al, Amaral JT et al, Valent VE et al, Samuels ER et al studies.

CONCLUSION:

The present study shows that classical music gives comfort to individual and it reduces sympathetic activity, and helps to improve the parasympathetic activity. Rock music and white noise gives discomfort to individual. They activate sympathetic nervous system, and reduces the activity of parasympathetic nervous system.

KEY WORDS:

HRV, Autonomic Nervous system, Electro Cardio Gram[ECG], Low Frequency, High frequency, acoustic startle reflex.