Original Research Paper

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Physiology

EFFECT OF GENDER DIFFERENCE ON SIMPLE AUDITORY REACTION TIME

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ABSTRACT Reaction time is a measure of the quickness with which an organism responds to some sort of stimulus. Time interval between onset of single auditory stimulus and initiation of response by the subject as early as possible is known as simple auditory reaction time.30 males and 30 females ,physically normal, were compared for the simple auditory reaction time at B. J. Medical college , Ahmedabad. Mean auditory reaction time is less in males as compared to females (p value < .001). from our study we concluded that males have faster auditory reaction than females.

KEYWORDS : Male, Female , Auditory reaction time

INTRODUCTION

Reaction time is a measure of the quickness with which an organism responds to some sort of stimulus. It is a measure of sensorimotor association and performance of an individual. it reflects the speed of flow of neurophysiological, cognitive and information processes which are created by the action of stimulus on the person's sensory system. Simple Reaction Time was first studied by Francis Galton in the late 19th century. later on Von Helmholtz worked on nerve conduction velocity, which is a component of reaction time (7)

Reaction time is very important for our everyday life and needs intact sensory system, cognitive processing and motor performance. The receipt of information can be through auditory system or visual system Time interval between onset of single auditory stimulus and initiation of response by the subject as early as possible is known as simple auditory reaction time. Three response are involved in this. These are stimulus processing , decision making and response programming. There are different types of auditory reaction time -simple reaction time, recognition reaction time and choice reaction time. Simple reaction time means one stimulus and one response (shorter duration) Recognition reaction time means there are some stimuli that should be responded to and others that should get no response. There is still only one correct response (longer).

Choice reaction time means there are multiple stimuli and multiple responses. the reaction must correspond to the correct stimulus (longest duration) Reaction time has been studied widely as its practical implications may be of great consequence e .g. A slower than normal reaction time while driving can have grave results Simple auditory reaction time evaluates the processing speed of central nervous system and co-ordination between the sensory and motor systems. Reaction time measurement includes the latency in sensory neural code traversing peripheral and central pathways, perceptive and cognitive processing and a motor signal traversing both central and peripheral neuronal structures and finally the latency in the end effectors activation.

In Humans the information flow can be represented in this way
Stimulus→ Sensory neuron → Spinal cord or brain → Motor neuron → Response

We hypothesised that gender may affect the decision making and response programming so this study was done to find out that if there is any difference in simple auditory reaction time between males and females.

MATERIALS AND METHODS

30 males and 30 females, physically normal, without any hearing or visual disorder in the age group of 15-45 years were studied in B.J. medical college, Ahmedabad. Simple auditory reaction time was recorded by Reaction time software in laptop. The procedure was explained to the subject and written consent was taken. Silent atmosphere was chosen for carrying out the study. Index finger of the dominant hand of participant was used on the spacebar to get a response. In our study, Participants used the earphones for receiving an auditory stimuli which was of 3000 Hz and of 90 db sound. Participants had to press the spacebar immediately after hearing the sound. Time interval between hearing the sound and pressing the spacebar was noted. Total ten such readings were measured and then mean simple auditory reaction time was measured.

RESULTS

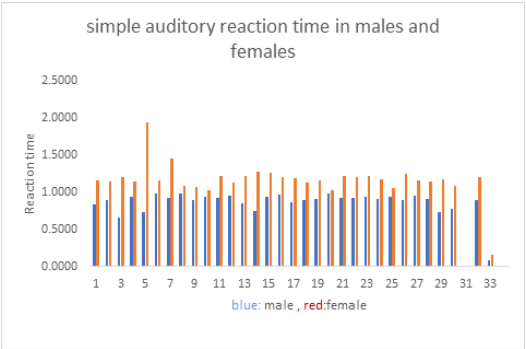
Statistical analysis of the received data was done which was compiled on Microsoft excel sheets. Students t test was applied to get the results. Mean Auditory reaction time was found to be significantly less in males as compared to females. Mean auditory reaction time for males was 0.8940±0.08 seconds and for females was 1.1992±0.16 seconds.

Table- 1. Comparison of Mean simple auditory reaction time

	Male	Female
Sample size	30	30
Geometric Mean	0.8940	1.1992
SD	0.0823	0.1646
P value	<0.001	

Table-1 shows in present study mean auditory reaction time for males was 0.8940±0.08 seconds while for females it was 1.1992±0.16 seconds enlightening that males had faster reaction than females with data showing significant value p<0.001.

Chart 1:



DISCUSSION

Our study data proposes that simple auditory reaction time is statistically less in males as compared to the females. Mean Auditory reaction time in male(0.8940 ± 0.08235) is less as compared to female (1.1992 ± 0.16465).

The influence of gender on reaction time shows that in almost every age group males have faster reaction time as compared to females . Research done by Mishra et al.(2) also showed that males responded faster than females. Study done by Shelton and Kumar(3), Nikam and Godkari (4) also reported similar findings to support females have

longer reaction time than males. The results of our study agree with these studies and indicate that males have faster reaction time when compared to females for auditory stimuli.

The male – female difference is due to the lag between the presentation of the stimulus and beginning of muscle contraction. Males demonstrated much more frequent and consistent reflex muscle activation than females. Moreover, muscle activation patterns were gender-specific(9) Muscle contraction is same for male and female and motor response in males are comparatively stronger than females .This explains why males have faster simple auditory reaction time.(5)

CONCLUSION

From our study we concluded that males have faster simple auditory reaction than females.

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