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Comparison of Auditory Response Time in Physically Active and Non-Active Type 2 Diabetics

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Abstract

Aim: To study the auditory response time of physically active type 2 diabetics and non-active type 2 diabetics. **Materials & Method:** The study was conducted on 30 physically active type 2 diabetics (age 46±3 years) and 30 physically non-active type 2 diabetics (46±3 years) males. Response Analyzer (audio-visual response time instrument) was used to measure the auditory response time. The stimulus was given by the buzzer and subject was required to response to the stimulus by pressing an appropriate button. **Result:** Audio 1 (1.08 ± 0.46 ms), Audio 2 (1.05±0.42 ms), Audio3 (1.08±0.40) ms, Audio 4 (1.11±0.39 ms) and combined auditory response time (1.08±0.33 ms) of physically active type 2 diabetics and Audio 1, Audio 2, Audio3, Audio 4 and combined auditory response time of physically non-active type 2 diabetics was 1.02 ± 0.31 ms, 1.11±0.44 ms, 1.18±0.58 ms, 1.27±0.52 ms, 1.14±0.37 ms respectively. **Conclusion:** It was concluded that the auditory response time was delayed in non-active type 2 diabetics than physically- active type 2 diabetics.

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Introduction

Physical inactivity and Obesity independently contribute to the development of type 2 diabetes; however, the magnitude of risk contributed by obesity is much greater than that imparted by lack of physical activity. It knows that physical training has positive effects on reaction time (Davranche et al., 2006 and Little and Williams 2005). Physical activity contributes to several positive effects on both physicaland mental health (Blair et al., 2001; Hallal et al., 2006).Obesity and physical inactivity are well-known risk factors for the development of type 2 diabetes (Chan JM et al., 1994 – Hu FB et al., 1999). A

reaction time measurement is a reliable indicator of processing of sensory stimulus by central nervous system and its execution in the form of a motor response (Aley L et al., 2007). It is an important method used for central information processing, speed and co-ordinate peripheral movement responses (Batra A et al., 2014). Type 2 diabetes is a major cause of morbidity and mortality and has become an important public health issue worldwide (Perkins2004). The relative risk of death is approximately 20% to 35% lower in physically active and fit persons compared to that in inactive and unfit persons(Warburton et al., 2006, Samitz et al., 2011).Physically exercise has been considered a cornerstone of diabetes management, along with diet and medication. However, high-quality evidence on the importance of exercise and fitness in diabetes was lacking until recent years.(Sigal et al., 2004).

Materials and Methods

Subjects- All the subjects were participated in the study voluntarily. There were 60 type 2 diabetics male subjects and out of which 30 were physically active and 30 non- active type 2 diabetics and their age ranged from 40-50 years. All the subjects were right handed, non-smokers, non-alcoholic. The auditory response time was measured by digital response time instrument, which is specially designed to measure response time in seconds that was Response Analyzer which had a display accuracy of 0.001 second. The auditory response time was recorded for low, medium, high and very high frequency sound stimuli. The stimulus was given by the buzzer. The subject was required to response to the stimulus by pressing an appropriate button. As soon as the stimuli was perceived by the subject, he responded by pressing an appropriate response switch. The display screen of the instrument indicated the response time in seconds. All subjects were given practice trails and were instructed to react as quickly as possible on every trial. The average of the three readings was taken as the value for auditory response time.

Data were analyzed using the Statistical Package for Social Sciences Software (SPSS 16.0 free trial version for Windows, SPSS Inc., Chicago, IL, USA). Mean and standard deviation was calculated.

Results and Discussion

Table 1. Descriptive Statistics of Physically-active Type 2 diabetics

Variables	Mean	Standard deviation
Age(years)	46.03	3.16
Height (cms)	171.97	7.70
Weight(kg)	78.46	11.75
Body Mass Index (kg/m^2)	26.47	3.69
Audio-1 (very high frequency sound) (sec)	1.08	0.46
Audio-2 (high frequency sound) (sec)	1.05	0.42
Audio-3 (medium frequency sound) (sec)	1.08	0.40
Audio-4 (low frequency sound) (sec)	1.11	0.39
Combined audio (1+2+3+4) (sec)	1.08	0.33

Table 2. Descriptive Statistics of physically non-active type 2 diabetics

Variables	Mean	Standard deviation
Age(years)	46.70	3.77
Height (cms)	170.30	5.74
Weight(kg)	78.77	17.34
Body Mass Index (kg/m²)	27.10	5.52
Audio-1 (very high frequency sound) (sec)	1.02	0.31
Audio-2 (high frequency sound) (sec)	1.11	0.44
Audio-3 (medium frequency sound) (sec)	1.18	0.58
Audio-4 (low frequency sound) (sec)	1.27	0.52
Combined audio (1+2+3+4) (sec)	1.14	0.37

Discussion

Table 1 and Table 2 shows mean height, weight, body mass index, auditory response time of physically active and non-active of type 2 diabetics. It was observed from results is that auditory response time was less that is better in physically active type 2 diabetics than non-active type 2 diabetics.

Conclusion

It was concluded that the auditory response time was delayed in non-active type 2 diabetics than physically- active type 2 diabetics.

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Conflict of Interest: None Declared