

ABSTRACT

Videogaming has always been a popular leisure activity in children, but current videogames encourage the use of a headset with mic since its more interactive and has a socialization aspect in addition to playing the game. The damage caused to hearing is still underestimated by parents as well as children in the context of video gaming especially First Person Shooter (FPS) which exposes the listener to loud sounds of fire arms. The WHO estimates that around 466 million people have a disabling hearing loss, 34 million out of which are in children. In the current case series study, patients with use of headphones while playing video games was examined for hearing problems. In this study which is a case series study, it was found that Hearing screening in school could help in early identification of hearing loss due to unsafe headphones usage in this unsuspecting pediatric population who all play FPS games. Still there is less awareness amongst healthcare professionals as well as community about the risk of developing hearing loss from unsafe listening from videogaming.

AIM

To examine whether loud noise exposure from Headphones while playing videogames poses a risk for developing Noise induced Hearing loss

METHOD

This case series study involves 3 school going children aged 10, 13, 14 years old; male gender) who were identified from routine School Hearing screening test (Audiometry hearing screening performed at 1000Hz, 2000Hz,4000Hz with a Pass criteria of 20dBHL) which they did not pass. These 3 children were then referred for diagnostic hearing assessment to the Audiology Clinic. The subjects were then referred to the Audiology clinic for diagnostic hearing assessment in the primary health care setting. All subjects reported history of playing videogames, particularly a very popular FPS online network game, with headphones for varying durations ranging from 1 to 5 hours a day, on most days of the week (as reported by Subject/ their parent). All subjects reported of perception of intermittent tinnitus in at least one ear. Neither the subjects nor their parents reported of any other sources of loud noise exposures in the past.

RESULTS

The school hearing screening results of the 3 subjects are mentioned in table below (red indicates absent responses).

Table 1 : Subject A

Audiometry Screening	1000Hz	2000Hz	4000Hz
Right ear (20dB)	Pass	Pass	Fail
Left ear (20dB)	Pass	Pass	Fail

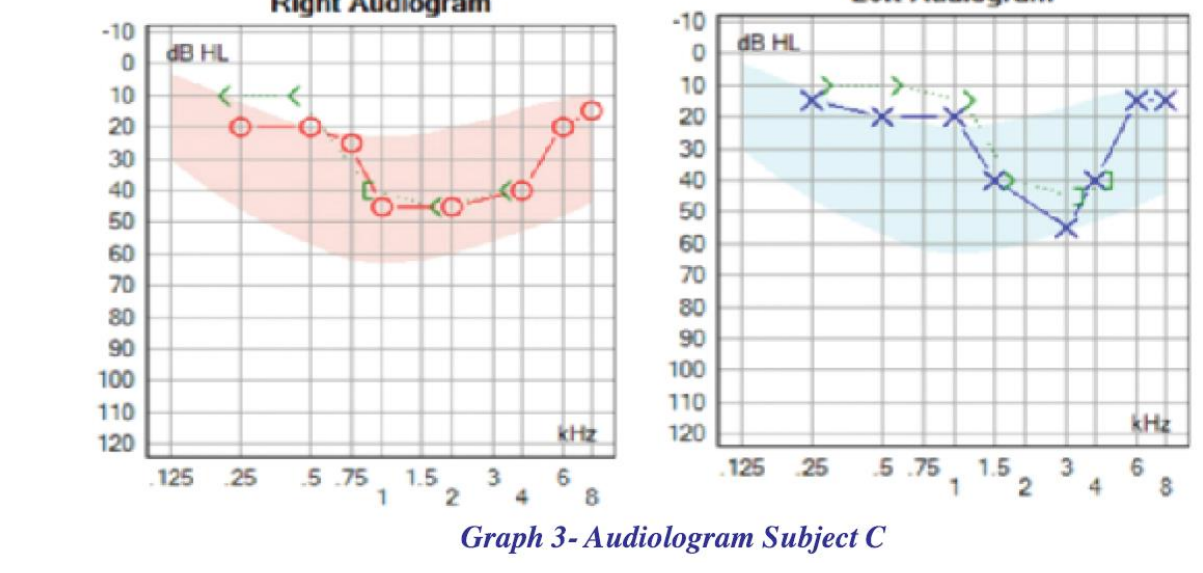
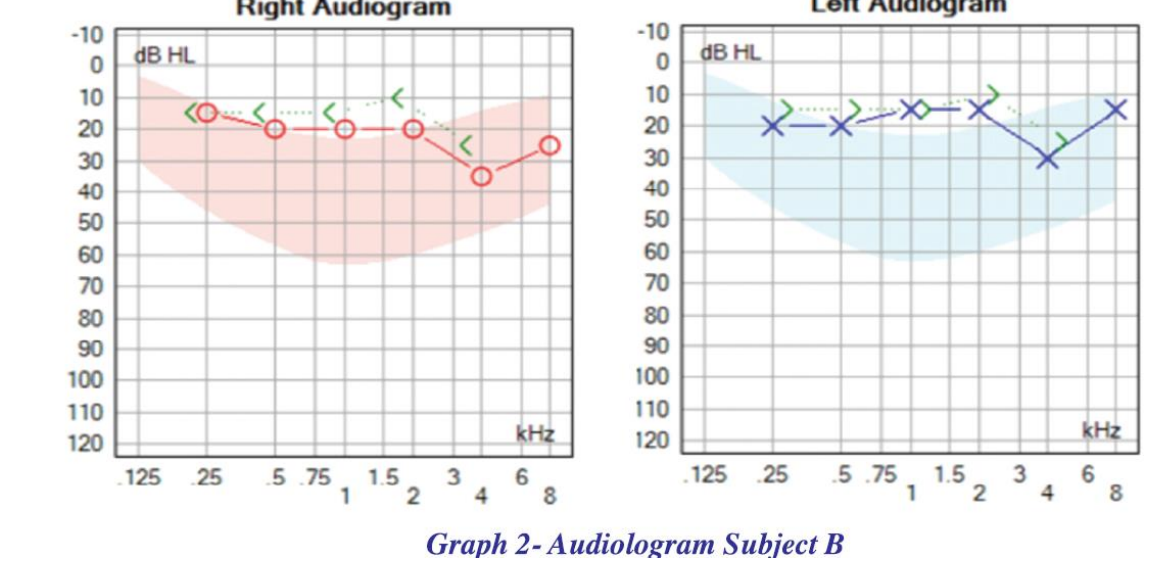
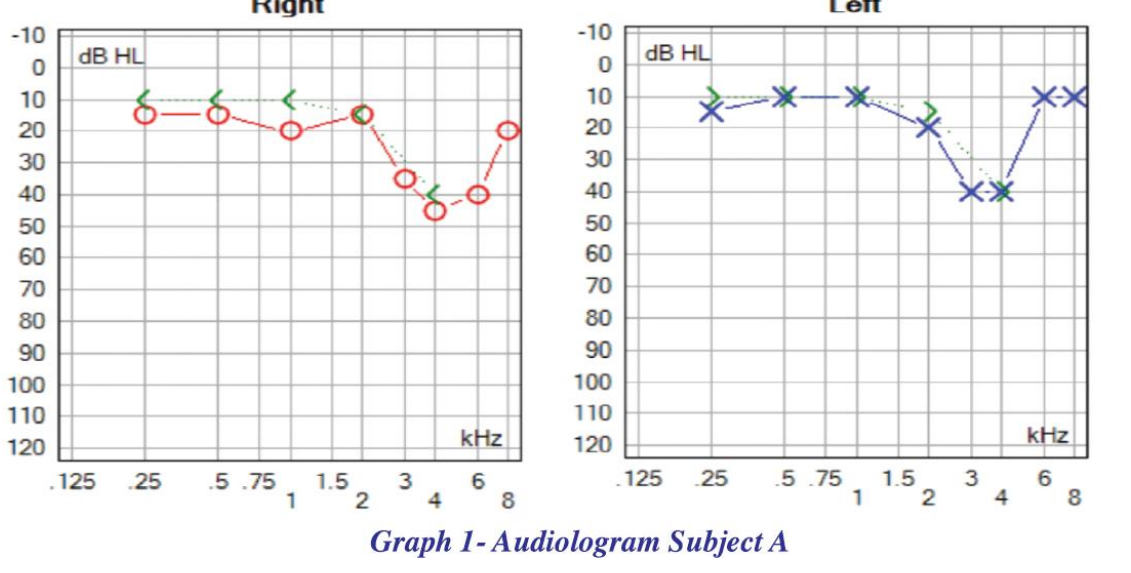
Table 2 : Subject B

Audiometry Screening	1000Hz	2000Hz	4000Hz
Right ear (20dB)	Pass	Pass	Fail
Left ear (20dB)	Pass	Pass	Fail

Table 3 : Subject C

Audiometry Screening	1000Hz	2000Hz	4000Hz
Right ear (20dB)	Pass	Pass	Fail
Left ear (20dB)	Pass	Pass	Fail

Pure tone Audiometry diagnostic assessment (mentioned in Graph below) reveals decreased hearing levels at 4kHz in both ears (4kHz average thresholds- Right ear: 43.33dB; Left ear:38.33dB) and diagnosed Bilateral high frequency SNHL; also all reported of occasional tinnitus.



DISCUSSION

During videogaming with headphones, sounds going to the ear can reach upto levels ranging from average 93dBC upto 118.7dBC (Iannace et al, 2020). Dillard et al (2024) recently published a systematic scoping review suggesting that gaming can be a possible source of unsafe listening. It reports that safe sound exposure levels for children per week are 83dB for approximately 6.5 hours, 86dB for approximately 3.25 hours, 92dB for 45 minutes, and 98dB for only 12 minutes. It is also mentioned that most gamers are under 18 years of age globally constituting 24%. All identified subjects in the current study were male. In current study, similar reported by Dehnert et al. (2015), Dreher et al. (2018) and Shin et al. (2005), males engage in playing video games for longer durations, more frequently, and at louder sound intensities. Videogaming can become addictive (Han et al, 2011), hence greater the risk of unsafe listening. Hence, it is very important to increase awareness amongst the younger population about the safe usage of headphones while playing video games. Also, it is important to routinely conduct hearing screening at schools to early identify noise-induced hearing loss and help prevent further progression of the degree of hearing loss.

CONCLUSION

Video gaming is here to stay, and it has become an increasingly popular form of entertainment for youth and adults alike. The captivating audio-visuals of the virtual world and the social aspect of network games have made them engaging for people all over the world. However, it is important to note that playing video games with headphones can pose a risk of noise-induced hearing loss (NIHL) to children. Hence, it is imperative that there is more awareness among children at the school level about the harmful effects of loud noise exposure, especially while using headphones for video gaming. It is crucial for schools to support hearing screening programs to identify NIHL in children at an early stage. Teachers and school management can play a vital role in this regard. A good referral system should also be in place to ensure that children who do not pass the school hearing screening can get further investigation at the earliest. This will help in prevention as well as early identification, and further progression of hearing loss. In this case series study, the diagnostic hearing evaluation revealed that three subjects had decreased high-frequency hearing thresholds in both ears at 4kHz. While some children may play video games at lower volumes and have normal audiograms, there is still a risk of developing NIHL if volume levels and usage duration are not regulated. Thus, further research is needed in this area and also to develop effective preventive measures.

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