

My Triumph Over Tinnitus: An Interview with Gita Bhattacharya

Q: State your name, age, location and anything else you would like to tell us about yourself.

A: My name is Gita Bhattacharya, and I am a 17-year old junior at a high school in southern California. Some of the things I enjoy are writing, listening to Japanese, and playing piano, guitar, and singing. I love all my classes at school; everything I learn is just so interesting. I am also a candidate for International Baccalaureate (IB) that gave me the opportunity to study philosophy. However, if I had to pick, I would have to say that biology is my favorite subject. Following my passion in biology, especially genetics, I created a club at my school called, “BLAST! Into Bioinformatics!” I would like to continue doing research in the medical or public health field when I graduate from high school and into the future.

Q: Why are you interested in tinnitus?

A: It was 2 a.m. on June 28, 2009. Everyone in my house was is asleep - except for me. Tossing, turning, putting my hands over my ears, trying to pretend the sound I heard was not there. This line of defense had been of no use to me for several nights in a row. Exasperated and exhausted, I googled “ringing in the ears” and learned that I had something called “tinnitus.” I pronounced it for the first time, opting for its more melodious sounding choice in pronunciation—tin-eye-tus. Soon, I was to pronounce yet another word - “hyperacusis,” which clarified why on 4 July, the fireworks had hurt my ears.

No doctor I went to could find a cure or a cause. I was left to do my own research. I discovered that tinnitus is actually more often a symptom than a disease. The cilia in the inner ear are responsible for transmitting sound sensations to the brain, and the brain makes sense of what we hear. If you damage these stereocilia from loud noise exposure, then there is no adequate sensory input going to the brain. So, your brain makes up for the lack of sensory input by creating its own activity, and that is why you “hear” buzzing or ringing. As of today, inner-ear cilia cannot be regenerated in humans. Once they’re damaged, it’s for life. I also learned that tinnitus is just like phantom limb syndrome, except the organ in this case is the cochlea and its stereocilia.

One of the things that affected me most was a video created by ATA. I was horrified to discover that listening to music at loud levels can be a main cause of tinnitus. I had played percussion and was in marching band, jazz band, and drumline for years prior the onset of my tinnitus. In the Pacific Youth Wind Ensemble I played the entire litany of percussion instruments and crashed my cymbals to triumph, the climactic glory in many a piece of music. I would listen to Japanese anime movies with my earbuds, eager to get every nuance of a new Japanese word. I listened to everything from marching band music to classical piano, jazz, and yes, even popular bands like Linkin Park. What teenager, doesn’t?! When I asked my uncle, a physician, about other causes of tinnitus, he told me that sometimes allergies or lingering sinus infections could

create the sensation of ringing in the ears. I remembered the nasty cold I had in the spring; I had briefly felt my ears ring then, but it had gone away. Could my tinnitus be a remnant of that?

I hoped so, because to me, that wasn't as serious as permanent hearing damage. But I didn't know. I really began to think that all the iPod listening and the loud instrument playing and proximity had done it to me.

It really hurt me to conclude that the music that I loved could be the reason for my tinnitus and my personal agony. I was confused. I felt alone. I eventually became depressed. No one could hear what I was hearing. The sounds were getting louder. There were nights when I did not sleep at all, and the whole thing was becoming a painful vicious cycle that was mentally and physically taxing. Marching band camp used to be the highlight of my summer, but now was, ironically, no longer enjoyable. Listening to the bird-like flutes and the bright trumpets no longer made me feel exhilarated. Listening to the music actually hurt. Nevertheless, I wanted to be drum major and I was not going to give up. I got custom-fit musician earplugs and switched to the tuba because the band needed a tuba player. Soon it became clear to me that if I wanted to protect my hearing and reduce my tinnitus, I had to quit marching band and the wind ensemble.

Left to myself, I began to read peer-reviewed articles on noise induced hearing loss from marching band music and MP3 players. This was about the time when I began contemplating doing my own research project to investigate causes of tinnitus. I asked myself, was it my iPod listening habits, or was it my being in drumline? Or was it both? I wanted to do research that could answer my questions. As the school year progressed, I read more about tinnitus and investigated possible research designs and statistical methods. By the end of year, I had chosen a survey design and an appropriate statistical method of controlling for other causes of tinnitus when trying to predict the effect of MP3 listening patterns on having tinnitus. I was excited to be able to take positive action towards understanding my tinnitus. I was tired of just being depressed. It was time I did something about it.

Q: Your interest in tinnitus prompted you to use the condition as part of a recent scientific competition – can you tell us a little more about the competition?

A: The competition I submitted my research to is called the [Young Epidemiology Scholars \(YES\)](#) competition, and is run by the National College Board. My biology teacher, Mrs. Ngo, knew about my tinnitus and that I was trying to understand possible causes of tinnitus. She suggested that I submit my research to the YES competition. After conducting surveys of 18 to 25 year-olds in my community, analyzing, and discussing my results, I submitted my 30-page

paper to the YES competition on February 1, 2011. Overall, the project took me 500 hours to complete.

Q: Did you place in the competition?

A: in mid -March 2011, the College Board notified me that my paper was accepted as one of the top 60 papers in the nation. I was invited to Washington, D.C. from April 15-18, 2011 to present my paper to a panel of judges. The presentations were divided into six regions with 10 presenters in each region. After the regional presentation, two people from each region were chosen to be the top 12 in the nation. At a memorable dinner at the Keck Center of the National Academy of the Sciences-a dinner I will never forget-I was selected to compete in the national competition. I presented my paper a second time to compete with finalists and the next morning at the national awards ceremony, and was awarded third place and a \$20,000 scholarship to the college of my choice.

Q: What did you find out from your survey?

A: I conducted a survey of 290 youth (15-25 years of age) over the November 2010 -January 2011 period to examine the effects of MP3 player listening patterns and ringing in the ear, or tinnitus symptoms. I found that relative to the “safe” listening level of 50% of the volume, those who listen at “unsafe” volume- are about 1.97 times more likely to experience tinnitus. I controlled for whether the person played a loud musical instrument or not and for the type of headphones used. I also found that those who play a loud instrument are 2.22 times more likely to experience tinnitus (from MP3 use) than those who do not, controlling for the unsafe volume and headphone type.

I did a separate iteration of the survey for another sample of students for the Orange County Science Fair in April 2011, where I won first place and several board awards. I found similar results with my new sample. All my results were statistically and numerically significant so I am confident that I found something new and important. My paper is the first to empirically estimate the effects of unsafe MP3 player use on tinnitus.

Q: What do you foresee being your next step in the world of tinnitus? Will you continue to study it?

A: My goal is to improve my survey and have it published in a peer-reviewed journal. I want to present my findings in a professional conference and talk with other scientists. There are just so many things I want to do research on; I want to study how we can re-grow damaged hair cells in the ear, why some people are more susceptible than others can to developing tinnitus, and to find a cure for the phantom limb syndrome as it pertains to tinnitus.

Q: Where are you hoping to go to college?

A: I hope to join a university with excellent research facilities. Perhaps, MIT, Harvard, or Stanford.

Q: If you could relay one message regarding noise, hearing impairment and tinnitus to your peers, what would it be?

A: Don't take your ears for granted! Wake up when your ears ring—which was the title of my research paper.

Q: Anything else you'd like to tell us that we might have left out?

At the Young Epidemiology Scholars competition dinner event, Dr. Harvey Fineberg, President, National Academy of Sciences, gave a wonderful speech where he said that epidemiology was about prevention. I want to prevent hearing damage from happening to others. MP3 player induced hearing damage is indeed a less noticed public health issue that is waiting to unfold. It is aptly characterized as a “newly identified health risk” by The Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR, 2008), and the following results of my survey I found that:

Youth awareness does not translate to safe listening

- 76% of those in my survey stated they were aware of MP3 player induced hearing damage; however, only 44% would lock volumes to prevent themselves from turning the volume up in noisy areas environments.

Existing measures taken by MP3 player and headphone manufactures are not adequate

- **80% do not see a warning label** on their MP3 players or headphones
- **80% were not aware** of the Apple 's website discussion of Noise Induce Hearing Loss

There is a need for Public Policy Measures as indicated in my survey results:

- “There must be **more serious warnings** of hearing damage on MP3 players, **like on cigarette packets.**”
 - **75% of survey respondents agree**
- “MP3 manufactures should be required to adopt the following measures” (respondent marked all that they agreed with)
 - **Default Volume Control:** 33%
 - **Warning Light** when Volume is Unsafe:61%
 - **Warning Label Directly** on MP3 player/headphone: 45%

- **None of the above measures** are needed 19.08%

What I would like to do:

- In my health classes, I learned about the harm done by drugs, alcohol, smoking, etc. Ironically, MP3 use is a ubiquitous phenomenon and outdated health textbooks have not yet introduced safe listening as a topic. I would like to work with the Department of Education to introduce music -induced tinnitus and hearing damage as a health topic in health science textbooks.
- I would like to work with the American Pediatric Association to require doctors to inform children of the dangers of MP3 player induced hearing damage. I am going to talk about the dangers of unsafe MP3 player listening in the summer health classes across schools in my district.
- A hair straightening iron has a prominent warning sticker on the electrical cord that it should not be used for eyelashes! Grocery bags have warning labels that they can suffocate children. Currently, the only warnings on MP3 players are in the owners' manuals and on Apple's website. How can MP3 player manufacturers and headphone manufacturers get away with this? Because the damage happens over years and there is no immediate danger. Moreover, it is not volume alone, but the interaction of volume with long listening durations and a poor quality headphone that is dangerous. Clearly, more research on safe listening guidelines is needed.
- I would like to work with ATA and be the teenage spokesperson to prevent music and MP3 player - induced hearing damage among the youth by educating the youth about music-induced tinnitus. Tinnitus is not only a precursor to hearing damage but a health issue in its own right.
- I would like to implement changes in public policy and work with Congress to require MP3 player manufacturers and headphone manufacturers to have warning labels directly on MP3 players and on headphones---warning labels that warn users of the of the dangers of prolonged exposure to loud volumes.

As for my own tinnitus, it does not bother me anymore. I have learned to ignore it. It was a test of my mettle and after being in a brief groove of despair, I think I have emerged triumphant.