

Letters to the Editor

To the Editor:

Tetracycline-Family Antibiotics and Pseudotumor Cerebri

The paper “Assessment of Objective Pulsatile Tinnitus in a Patient with Syringohydromyelia,” authored by Steiger, Saccone, and Watson, in the March 2007 (Vol. 18, No. 3) issue of the *Journal of the American Academy of Audiology*, presented an interesting audiologic case in which objective tinnitus was measured using a traditional hearing-aid stethoscope as well as a probe-mic system. Also of great interest was the discussion on the possible etiology of this objective tinnitus. One of the causes was proposed to be pseudotumor cerebri (PTC), a benign type of intercranial hypertension (for review, see Friedman and Jacobson, 2002).

This paper was focused on two etiologies for PTC most relevant in this case: syringohydromyelia and tetracycline therapy. However, the categorization of tetracycline as “a doxycycline” was inappropriate. Both tetracycline and doxycycline are antibiotics from the tetracycline family. These broad-spectrum drugs exert their antibiotic activities by disrupting the translation of genetic information coded in mRNA into protein that is vital for the survival of microorganisms (e.g., bacteria, Rickettsia, Chlamydia, etc.) (see Facts and Comparisons, 2005). Because tetracycline is the prototype, this group of drugs is sometimes referred to as “the tetracyclines.” Therefore, doxycycline is a tetracycline, but not vice versa. Other common tetracycline-family drugs include minocycline, democloxycline, and oxytetracycline. We have to pay special attention when talking about tetracycline or tetracyclines. Note that some side effects are unique to one specific drug but not all tetracyclines. For example, minocycline is the only tetracycline-family drug reputed to cause vestibular disturbances (Laurence et al, 1997).

It should be noted that a large portion of the references on drug-induced PTC in the article involved one particular tetracycline-family drug, that is, minocycline (e.g., Chiu et al, 1998; Weese-Mayer et al, 2001), but not doxycycline. Evidence of doxycycline-caused PTC is meager (Friedman, 2005). The prototype, tetracycline, which was used in this case study, has also been associated with

PTC (e.g., Nagarajan and Lam, 2000). The incidences of drug-specific PTC vary across studies. Some reported higher incidence with the prototype (Friedman, 2005), whereas others specified minocycline is more potent in inducing PTC than the other tetracyclines (Kesler et al, 2004).

It is interesting that the patient in this case was under tetracycline therapy in 2003 and 2005. Upon the second therapy, there was a clear recurrence of symptoms similar to the first time (e.g., diplopia). Recurrence of PTC has been formerly reported on rechallenge of minocycline (Medsafe, 2001), and permanent visual defect can present even after minocycline-induced PTC has resolved (Chiu et al, 1998; Mochizuki et al, 2002). Hence, it may be for the medical community’s interest that this article be reported to reflect the role of tetracycline reuse in the recurrence of PTC. Given that the syringohydromyelia was considered medically as a normal variation in this case, the patient’s PTC could be the result of the tetracycline therapy.

Tetracycline-family antibiotics have attracted growing attention from hearing scientists and audiologists. Recently, minocycline was shown to protect hair cells against neurodegenerative processes (Corbacella et al, 2004), and doxycycline was also reported to reduce cochlear mortality by minimizing inflammatory mediators (but not through its antibiotic activity) (Meli et al, 2006). These promising results suggest that the tetracycline-family drugs may actually be beneficial to the auditory system!

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Reply to Lu-Feng Shi

My coauthors and I thank Lu-Feng Shi for the careful consideration given to our paper entitled “Assessment of Objective Pulsatile Tinnitus in a Patient with Syringohydromyelia.” We appreciate Lu-Feng Shi’s opinion that the patient’s intracranial hypertension “could be the result of the tetracycline therapy.” To be clear, however, this patient was not diagnosed with intracranial hypertension. Moreover, suspicious symptoms preceded tetracycline use and persisted without tetracycline use. For these reasons we chose to report apparent tetracycline exacerbation of symptoms that were suspicious for intracranial hypertension.

More importantly, we appreciate Lu-Feng Shi’s understanding that “doxycycline is a tetracycline, but not vice versa” as we concluded based on our literature review. Interested readers will appreciate this as well as the added literature review on medications of interest.

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ERRATA: In the article “Assessment of Objective Pulsatile Tinnitus in a Patient with Syringohydromyelia,” Steiger et al, March 2007 (Vol. 18, No. 3), the captions for Figures 2, 3, and 5 (pp. 200, 203) are incorrect. The corrected captions appear below.

Figures 2 and 3. The data series without shading was obtained with the ear canal open; the data series shaded black was obtained with the ear canal plugged with a foam audiometric insert earphone; and the data series with gray shading was obtained with the ear canal plugged with silicone impression material.

Figure 5. Probe microphone 1/3-octave noise measures of the right ear canal. The data series without shading was obtained with -300 daPa ear canal pressure; the data series with black shading was obtained with +200 daPa ear canal pressure; and the data series with gray shading was obtained with 0 daPa ear canal pressure.