

INITIAL SUBJECT EXPERIENCE DURING A 7 TESLA EXAM

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PURPOSE

Subject experience is a critical factor for the successful completion of a research MRI scan. Environmental and mechanical factors such as noise, temperature, and vibration all play a role in the scan process. In addition, lightheadedness, peripheral nerve stimulation (PNS), and nausea can all be symptoms that manifest during an MR examination. In this study we look to observe and explore all the possible experiences one can potentially encounter during an exam on a 7 Tesla scanner.

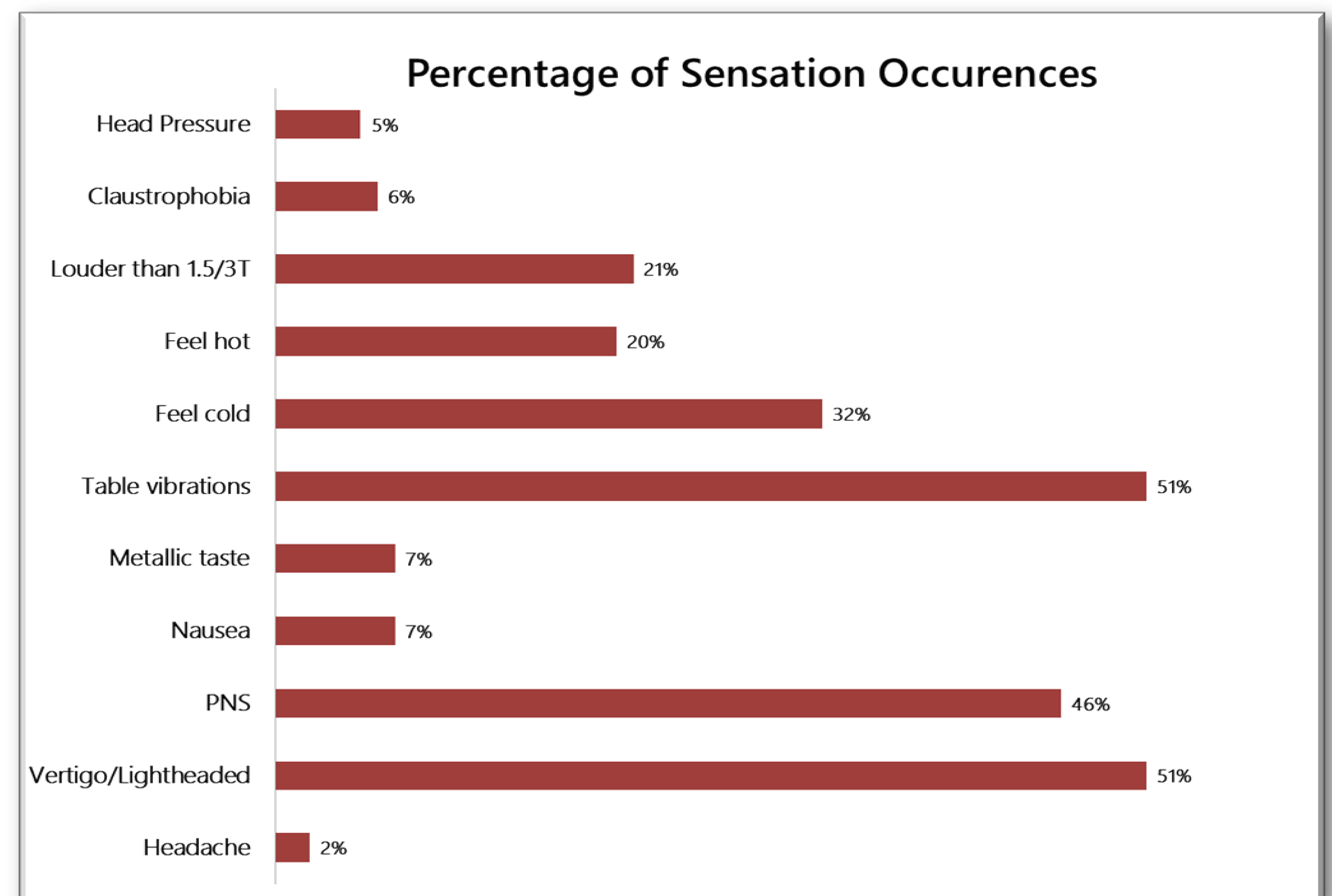


METHOD

One hundred healthy research participants between the ages of 18-70 were recruited and screened for MRI contraindications at 7T, orthopedic implants were allowed. Participants were scanned on a GE MR950 7 Tesla scanner (GE Healthcare, Milwaukee, WI USA). Brain and knee images were acquired using a variety of imaging techniques, including fast spin echo, proton density, gradient echo, inversion recovery, time of flight angiography, and echo-planar diffusion weighted imaging. Total image acquisition time for each participant was approximately one hour. After the scan was complete, participants were requested to complete a questionnaire about their experience both during and immediately following their MRI scan. Participants indicated which sensations occurred such as headache, lightheadedness, vertigo, PNS, nausea, metallic taste, table vibrations, body temperature, scanner noise level, and claustrophobia.

RESULTS

Lightheaded/vertigo and table vibrations were the two most common sensations with 51 participants each (51%). Peripheral nerve stimulation (PNS) was the third highest sensation with 46 participants (46%). Twenty-one participants (21%) felt the 7T was louder than a 1.5T or 3T and their body temperature varied with 32 participants (32%) feeling cold and 20 participants (20%) feeling hot. Less than 10% of the participants experience metallic taste, claustrophobia, head pressure, nausea, and headache. Participants tolerated all sensations well with little discomfort.



CONCLUSION

Despite the fact that a significant amount of participants reported lightheadedness/vertigo, table vibrations, and mild PNS, none of these sensations necessitated premature termination of the scan. We found similar experiences as compared to other imaging field strengths with an increase rate of vertigo reported at 7T, which quickly abated once the subject stopped moving into/out of the scanner bore. Therefore, it can be concluded that the successful completion of a 7 Tesla MRI scan is not influenced by the minimal sensations the participants experience during the MRI exam.

