

The Environment may play a role in ear infection

Otitis media (Glue ear) is a major cause of earache and this review approaches causation from an environmental, and not simply body-related, infection.

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Jeff Charlton, Lead Author

Ltd has announced a new research framework examining the ear and Eustachian tube as potentially under-recognised interfaces between environmental exposure, chronic inflammation, hearing disturbance and vestibular symptoms.

The author manuscript, ‘The Ear as an Under-Recognised Interface Between Environmental Exposure, Chronic Inflammation and Neurovestibular Dysfunction: A Framework for Clinical Investigation,’ is led by

environmental investigator Jeff Charlton and co-authored with audiologist Dr Dayna Edwin.

The framework starts with an established anatomical relationship. The Eustachian tube connects the middle ear with the upper throat and helps ventilate the middle ear, equalise pressure and clear secretions. Inflammation affecting the nose, throat or adjoining upper-airway tissues may therefore be relevant when investigating Eustachian-tube dysfunction and middle-ear fluid or pressure problems.

The paper proposes a structured research pathway: environmental exposure may contribute to chronic upper-airway inflammation in a susceptible person; inflammation may affect Eustachian-tube function; impaired ventilation or clearance may contribute to middle-ear inflammation or fluid retention; and persistent middle-ear disturbance may be associated with hearing, tinnitus, dizziness, balance or other vestibular complaints.

The framework does not claim that indoor mould or another environmental agent directly causes glue ear, otitis media, hearing loss, vestibular disease or brain inflammation. It identifies a sequence of clinically assessable questions that may be overlooked when building conditions, upper-airway symptoms and ear complaints are considered separately.

‘People often divide a case into a building problem, a sinus problem, an ear problem and a balance problem,’ said Jeff Charlton, Principal Consultant at Building Forensics Ltd. ‘Our purpose

is not to assume they have one cause. It is to ask whether timing, anatomy, inflammation and exposure history justify a properly coordinated environmental, audiological and medical investigation.'

Dr Dayna Edwin's audiology contribution focuses attention on objective assessment rather than symptom speculation. Relevant clinical investigations may include otoscopy, tympanometry, hearing tests and, where indicated by a qualified clinician, vestibular assessment. Environmental investigation remains separate and may examine dampness, moisture, ventilation, contamination reservoirs and plausible exposure pathways.

Peer-reviewed studies support parts of the proposed chain without proving the complete environmental pathway. Research has reported associations between chronic rhinosinusitis and Eustachian-tube dysfunction. Studies of chronic otitis media have also found higher rates of vestibular symptoms, abnormal vestibular findings and poorer postural control than in control groups, with greater middle-ear inflammatory activity associated with more severe hearing and balance problems.

The authors emphasise that these findings do not establish individual causation. Ear, hearing, balance, cognitive or neurological symptoms require appropriate medical assessment, and urgent or progressive symptoms should not be delayed while environmental questions are investigated.

The research forms part of a broader Building Forensics programme examining how indoor environmental conditions may interact with human exposure and vulnerability. The programme distinguishes observed building conditions, reported symptoms, clinical findings and scientific inference so that one form of evidence is not mistaken for another. There is sufficient evidence to consider environmental assessments alongside medical investigations, especially when symptoms recur.

About the authors

Jeff Charlton is Principal Consultant at Building Forensics Ltd and has more than three decades of experience across water damage, mould, biological contamination, indoor environmental investigation and exposure-pathway assessment. Dr Dayna Edwin is an audiologist contributing specialist knowledge concerning hearing, Eustachian-tube function, middle-ear disturbance and neurovestibular symptoms.

Research sources

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