



Editorial

CSF Flow Dynamics—Is There a Need for Normative Imaging Data?

Jitender Saini¹ Shikha Awasthi¹

¹Department of Neuroimaging and Interventional Radiology, National Institute for Mental Health and Neurosciences, Bengaluru, Karnataka, India

Indian J Radiol Imaging 2024;34:199.

It was with great enthusiasm that we read the article titled “CSF flow parameters in normal subjects above forty years.”¹ It evokes a great deal of thought process and critical reflection in the utility of having normative cerebrospinal fluid (CSF) flow data. This study further gains importance in the Indian context as we do not have CSF flow normograms for our local population.

CSF plays a crucial role in cushioning the brain, maintaining normal intracranial pressure, and supporting neurological functions. CSF spaces in the brain include ventricles, cerebral and spinal subarachnoid spaces and they are present at dynamic equilibrium with cerebral blood and brain parenchyma. Any alteration in one is compensated by increase or decrease in other components.² In recent years, knowledge about the role of CSF and CSF dynamics in various neurological disorders has increased due to new inventions in the field of magnetic resonance imaging (MRI) in the form of phase-contrast studies.

Phase-contrast MRI is a study that provides both qualitative and quantitative information about CSF dynamics and is useful for the evaluation of Chiari I malformations, normal pressure hydrocephalus, aqueductal stenosis, and syringomyelia. The CSF flow parameters are altered in all the above conditions, as well as in other conditions such as meningitis and cerebral edema.^{3,4} However, there is no normative data to correlate the altered flow dynamics in Indian population, which this study aims to acquire. The authors have acquired five flow-related parameters and have grouped them according to decades.

This study contributes vital insights into the age-related variations in CSF flow parameters, emphasizing the im-

portance of establishing normative data. The linear increase with age, coupled with decade-specific medians, provides a more accurate reference for conditions like normal pressure hydrocephalus. The findings underscore the need for nuanced interpretation, considering age and sex, in clinical assessments relying on CSF flow dynamics. Generating normative data are crucial for advancing diagnostic precision and enhancing the potential of CSF flow parameters in monitoring and prognosis after treatment. However, the sample size studied was small and hence more studies are required in the future to ascertain the normative data for Indian population for better correlation of CSF flow studies.

Conflict of Interest

None declared.

References

- 1 Rohilla S, Kumar P, Singh I. Cerebrospinal fluid flow parameters in normal subjects above 40 years of age. *Indian J Radiol Imaging* 2024;34(02):208–213
- 2 Mokri B. The Monro-Kellie hypothesis: applications in CSF volume depletion. *Neurology* 2001;56(12):1746–1748
- 3 Horie T, Kajihara N, Matsumae M, et al. Magnetic resonance imaging technique for visualization of irregular cerebrospinal fluid motion in the ventricular system and subarachnoid space. *World Neurosurg* 2017;97:523–531
- 4 Yamada S, Tsuchiya K, Bradley WG, et al. Current and emerging MR imaging techniques for the diagnosis and management of CSF flow disorders: a review of phase-contrast and time-spatial labeling inversion pulse. *Am J Neuroradiol* 2015;36(04):623–630

Address for correspondence
Jitender Saini, MD, DM,
Department of Neuroimaging
and Interventional Radiology,
National Institute for Mental
Health and Neurosciences,
Bengaluru 560029, Karnataka,
India
(e-mail: jsaini76@gmail.com).

DOI <https://doi.org/10.1055/s-0044-1781468>.
ISSN 0971-3026.

© 2024. Indian Radiological Association. All rights reserved.
This is an open access article published by Thieme under the terms of the Creative Commons Attribution-NonDerivative-NonCommercial-License, permitting copying and reproduction so long as the original work is given appropriate credit. Contents may not be used for commercial purposes, or adapted, remixed, transformed or built upon. (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)
Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India