Author's Reply: Effect of Endemic Fluorosis on Cognitive Function of School Children in Alappuzha District, Kerala: A Cross-Sectional Study

Sir,

We thank the authors for taking a keen interest in our article titled "Effect of Endemic Fluorosis on Cognitive Function of School Children in Alappuzha District, Kerala: A Cross-Sectional Study."[1] We appreciate their critical comments about the manuscript and wish to provide our responses to the queries raised by the authors.

We entirely agree with the first comment regarding the disparity between Spearman's correlation coefficient [correlation between the severity of dental fluorosis and Raven's Standard Progressive Matrices (SPM) grades] value mentioned in Table 4 (0.452) and that in the text (0.740). The correct value is 0.740 itself, and 0.452 was a typographic error. We sincerely regret this inadvertent mistake. We agree that we could have measured the correlation between digit span and Dean's fluorosis index. However, the correlation between Raven's SPM grades and severity of fluorosis was strong enough to conclude. We proceeded with the Chi-square test instead of Fisher's exact test as ours was not a 2 × 2 contingency table, and we analyzed by combining some of the cells to eliminate the cell count problem. Further, we calculated the Fisher – Freeman –Halton Exact value as well which was significant.

The next criticism raised is about only using the digit span test among the entire battery of 11 subtests in Malin's Intelligence Scale for Indian Children (MISIC).[2] The administration of the complete battery of MISIC would be cumbersome and time-consuming. Hence, we selected the MISIC digit span subtest as this would serve as a quick and convenient screening test for cognitive impairment. As we were not running the complete battery of MISIC, we opted to proceed with the raw scores instead of test quotients. Regarding the question of whether any participant had features of compressive myelopathy, radiculopathy, or attention deficit hyperactivity disorder (ADHD)/specific learning disability, it was beyond the scope of the present study to assess it. Definitely, these conditions comprise an entire spectrum of neurological complications of endemic fluorosis, and further studies are required to address it.

Another criticism raised mentions that, in the study by Arora *et al*. cognitive impairment was found in 3.1% of the population, while in the present study controls, around 15% performed below average. In that study, Arora *et al*. used the Stanford Binet Intelligence Scale that measures intelligence quotient (IQ) to estimate the prevalence of children with IQ <70 in the age group 2–9 years, which corresponds to the intellectually impaired category rather than below-average category.[3] Hence, this would correspond to the grade V (intellectually impaired) in Raven's SPM, which in our study is 0%. As correctly pointed out, many genetic, socio-economical, and geographical factors have been known to influence the cognitive function of an individual.[4] We have mentioned in the limitations of the study that, though we have tried our best to select a homogenous sample with regard to socio-economic, environmental, and inherited factors, the complete exclusion of such factors is not possible. Finally, we wish to clarify that, the person who administered the neuropsychometric tests was blinded to the fluorosis status of the children.

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Conflicts of interest

There are no conflicts of interest.

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