Selective Dorsal Rhizotomy for the Treatment of Spasticity Associated with HIV Encephalopathy (HIVE) in 15 Pediatric Patients

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Abstract

Introduction: Vertical transmission of HIV has decreased in developed countries but remains prevalent in developing nations. HIV-associated encephalopathy (HIVE) leads to severe neurological sequelae, including spasticity. Selective dorsal rhizotomy (SDR) is known to reduce spasticity and improve motor function in children with cerebral palsy, but its use in HIVE has not been well studied. This is the first study to evaluate the outcomes of SDR in children and adolescents with HIVE MATERIALS AND METHODS. A retrospective cohort study was conducted at two specialized centers, including 15 pediatric patients with progressive subacute HIV-associated encephalopathy and spasticity, who underwent selective dorsal rhizotomy between 2010 and 2022. The variables evaluated included the Gross Motor Function Classification System (GMFCS), the Functional Mobility Scale (FMS), the Gillette Functional Assessment Questionnaire (FAQ), and the Ashworth Scale (EAM) to measure muscle tone.
Method: 1- Operative Technique Selective dorsal rhizotomy (SDR) was performed under general anesthesia with the patient in the prone position. Subdermal electrodes were placed in specific muscles for intraoperative mapping. A laminotomy was carried out from L2 to S1, and after opening the dura mater, the dorsal roots from L2 to S1 were identified. Radicles with the lowest stimulation threshold were selected for rhizotomy. In most cases, 25% of the root was sectioned, guided by neurophysiological monitoring. The laminae were fixed using titanium bone plates. Patients remained on bed rest for two days before beginning mobilization. All patients underwent intensive motor rehabilitation following SDR. 2- Functional Outcomes The mean age was 11.8 ± 3.12 years. At the 24-month follow-up after SDR, a significant reduction in spasticity was observed across all muscle groups, as measured by the Modified Ashworth Scale (MAS) ($p < 0.001$). Most children (94%) maintained the same GMFCS level at 24 months postoperatively, while 6% improved by one level. No significant long-term differences were found in the Functional Mobility Scale (FMS). General ambulatory function, as measured by the FAQ, showed a statistically significant improvement in many participants.
Discussion: The results demonstrate a significant reduction in spasticity and improvements in functional capacity, suggesting that selective dorsal rhizotomy (SDR) is a viable treatment option for managing spasticity in this patient population. When combined with an intensive physiotherapy program, SDR can lead to substantial improvements in the quality of life of patients with HIV-related encephalopathy.
Conclusions: Selective dorsal rhizotomy (SDR) is effective in reducing spasticity and improving motor function in children with HIV-related encephalopathy, offering a promising treatment option to enhance their quality of life. Long-term studies with larger patient cohorts are needed to confirm these findings.

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