

Anatomy of spinal dorsal rami and its implications in back pain

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The diagnosis and treatment of back pain are challenging. Knowledge of neuroanatomy and biomechanics of the spinal dorsal rami are crucial. The spinal dorsal rami are the posterior branches of the spinal nerve. They innervate back from the occiput to the sacrum. The dorsal rami of C2 and C3 become greater, lesser and third occipital nerves. Dysfunction of these nerves can cause cervicogenic headache. In the low cervical and lumbar spine, each spinal dorsal ramus divides into medial and lateral branches. The medial (small) branch supplies the tissues from the midline to the zygapophysial joint line and innervates two to three adjacent zygapophysial joints and soft tissues. The lateral (large) branch innervates the tissues lateral to the zygapophysial joint line. The dermatome of the dorsal ramus is completely different from the dermatome described in the text book. Clinically, the pain presentations follow these anatomic distributions, which can be used for localization of the disordered dorsal ramus. The

diagnosis can be confirmed by single dorsal ramus block by resulting in relief of pain and muscle spasm. Anatomically, the common dorsal ramus and its medial and lateral branches surround the zygapophysial joint, which serves as a pivot of the spinal functional unit. Any abnormal movement or pathology of the zygapophysial joint can cause stress or tension to the dorsal rami and induce back pain. Clinically, in the low back, L1 and L2 are the most common sites of dorsal rami disorder, because of their anatomical and biomechanical factors. Treatments of back pain include spinal dorsal ramus injection, percutaneous neurotomy and core muscle strengthening exercise. Summarily, disorder of the spinal dorsal ramus is an important source of back pain. Based on the anatomy and clinical presentation, the disordered spinal dorsal ramus can be localized and treated.

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