

Musculocutaneous nerve variations. Meta-analysis of proportions and proposal for categorization

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The musculocutaneous nerve (MCN) is one of the main terminal branches of the brachial plexus. It provides motor innervation to coracobrachialis, biceps brachii and brachialis muscles and sensory innervation to the skin of lateral side of the forearm. In the normal anatomical description, the MCN arises from lateral cord and don't have communication with other terminal branches of brachial plexus. All motor branches arises from MCN, directly.[1] Despite these considerations, several variations of MCN have been reported. The most common are anomalous communications between MCN and median nerve. These communications could be relevant in clinical practice and could have several practical considerations that should be evaluated in different medical area, such as orthopedic surgery, traumatology or neurophysiology. Several classifications have been proposed but none of these is able to cover all aspects of this variation. Therefore, the aim of the present study are a systematic review of the available literature about MCN variations and a meta-analytic approach to define their prevalence.[2] At the same time, a new model of categorization with practical effects on clinical reasoning has been proposed. Several electronic databases have been searched. Articles have been screened and papers with anatomical description of MCN variations have been included. 43 out of 661 articles fulfilled inclusion criteria, with a description of 4695 brachial plexuses dissections. The random pooled prevalence of MCN variations is 18% (95%CI: 15-21%). The new categorization proposal is based on a 3 areas model: Area 1 (1A: absence of musculocutaneous nerve, 1B: variations before the division of the musculocutaneous nerve from lateral cord); Area 2: variations between origin of MCN from lateral cord and point of in coracobrachialis muscle (or same level if MCN does not pierce the muscle); Area 3: variations distal to point of entry in coracobrachialis muscle; Mixed areas: variations reported in more than a single area described above. Applying this model, the random pooled prevalence of reported variations is: Area 1A: 19% (95%CI: 11-28%), Area 1B: 26% (95%CI: 14-39%), Area 2: 46% (95%CI: 33- 59%), Area 3: 55% (95%CI: 40-70%), Mixed areas: 16 (95%CI: 8-25%). Therefore, MCN variations have a high prevalence. Among them, the most frequent are localized distal to coracobrachialis muscle. These results could be useful in clinical practice to point the attention at this anatomical region where variations in MCN are very common.

References

- [1] Nerves of the upper extremity. Mark Mahan and Robert Spinner. Bergman's Comprehensive Encyclopedia of human anatomic variation, first edition. 2016 John Wiley and Sons, Inc.
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Keywords

Musculocutaneous nerve, median nerve, anatomical variation