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The Relationship of Mean Capillary Number with Age Using Nailfold Capillaroscopy in Healthy Individuals

Mean capillary number (MCN) is a frequently studied quantitative parameter obtained by Nail Fold capillaroscopy (NFC). NFC is a non-invasive imaging technique to directly visualize capillaries for MCN and capillary morphology, to assess rheumatologic diseases such as scleroderma. More recently, it has been used to evaluate capillaries in other diseases such as diabetes and hypertension. The technique is easily performed using a hand-held imaging device. It has been used primarily in adults, but also to a lesser extent in children. Although studies in separate populations have suggested the MCN to be lower in children, we are unaware of a study that has assessed MCN over a wide age range. The reason for higher capillary number in adults compared to children is unknown. One hypothesis is increasing capillary number may be a compensatory mechanism to age related progressive microvascular impairment. We studied MCN over a wide age range in a large group of healthy participants to elucidate the relationship of age to MCN. A total of 253 participants (155 female; age 5 to 80 years old) were studied using a portable digital microscope (Dinolite; California USA). The number of capillaries located in the distal row along a linear millimeter (mm) of the cuticle in 8 fingers (thumbs excluded) were counted and averaged. MCN was found to increase with age ($r=.22$; $p<.001$) and BMI ($r=.17$; $p=.006$). On linear regression analyses, MCN was independently related to age ($\beta= 0.16$, $p=0.015$) but not to BMI ($\beta= 0.09$, $p=0.19$) ($R^2=0.04$, $p=0.005$ for model). When divided into four age groups based on 20 yr increments, there was a significant increase in MCN for the groups determined by ANOVA ($p=0.009$). In summary, we found MCN to increase with age in healthy individuals over a wide age range. This may aid in studies of MCN in cohorts of varying ages and diseases.

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