



Variations in Choroidal Metrics among Children Experiencing Malnutrition

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DESCRIPTION

Childhood malnutrition remains a global health concern, especially in low and middle-income countries. It affects growth, immunity and neurodevelopment, but its impact on ocular structures, particularly the choroid, has received limited attention until recently. The choroid, a vascular layer situated between the retina and the sclera, is vital for maintaining photoreceptor function. Advances in imaging technology, particularly Enhanced Depth Imaging Optical Coherence Tomography (EDI-OCT), have allowed clinicians and researchers to assess subtle changes in choroidal structure.

Among the measurable parameters, choroidal thickness and Choroidal Vascular Index (CVI) are regarded as indicators of vascular supply and tissue integrity. This article aims to explore how these two markers are affected in children suffering from malnutrition, focusing on observational data, physiological mechanisms and possible implications for broader health monitoring.

Malnutrition in childhood

Malnutrition encompasses undernutrition (stunting, wasting and underweight) and micronutrient deficiencies. Its etiology is multifactorial, involving inadequate food intake, infections, chronic disease and socio-economic factors.

The effects on growth and cognition are well documented, but its ocular consequences are often limited to corneal and conjunctival manifestations. Recent studies, however, point to more subtle retinal and choroidal involvement, suggesting that ocular imaging could serve as a non-invasive adjunct to assess systemic nutritional status.

Measurement tools

Enhanced Depth Imaging Optical Coherence Tomography (EDI-OCT) allows high-resolution cross-sectional imaging of the choroid. It provides quantitative data on:

Choroidal Thickness (CT): Measured perpendicularly from the outer border of the Retinal Pigment Epithelium (RPE) to the inner scleral surface.

Choroidal Vascular Index (CVI): Represents the ratio of luminal (vascular) area to total choroidal area in a given scan, reflecting the vascular component of the choroid.

CVI has emerged as a more stable metric than CT since it accounts for structural variability caused by age, hydration status and intraocular pressure.

CONCLUSION

Choroidal thickness and vascular index are promising indicators of ocular vascular health and may reflect systemic disturbances caused by childhood malnutrition. Evidence suggests that both parameters are reduced in affected children, potentially as a result of impaired vascular development, chronic inflammation and micronutrient deficits. While further validation is required, these non-invasive markers may contribute to a more holistic understanding of malnutrition's effects and open pathways for multidisciplinary research and monitoring.

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