

The manuscript addresses an interesting and potentially important topic, particularly because the interaction between glial development, metabolism, white matter injury and myelination is highly relevant to neonatal brain vulnerability. The attempt to integrate cellular biology, metabolism, neuroimaging and omics has its potential. However, in its current form, I would recommend major revision because of the following:

- There is a statement: "In neonates, astrocytes develop between 26th–27th weeks of gestation". Later, the manuscript itself cites literature describing astrocytogenesis substantially earlier in development and discusses astrocytes at approximately 20 weeks' gestation. This creates a conceptual inconsistency. I suggest reframing the developmental question to which cellular and metabolic mechanisms support oligodendrocyte maturation before astrocytes acquire their mature functional phenotype.
- The authors repeatedly use terms such as "myelin loss", "demyelination", "myelination failure", "delayed myelination", and "impaired myelination" in a developing brain context. My opinion is that these concepts are not interchangeable.
- The section on oligodendrocyte immunology is disproportionately long to its relevance to the review. The space given to MHC expression, antigen presentation and inflammatory cytokines produced by oligodendrocytes in the manuscript interrupts the metabolic narrative. I suggest reducing this subsection.
- The imaging/radiomics section is too detailed relative to the purpose of the review. If the authors decide to keep this section in its full length, I recommend redesigning it with some other answers, like what are the limitations of imaging, whether it has been validated against histopathology or molecular measures or whether it can distinguish maturation from injury.
- The authors should ensure that every major biological assertion in the Figure 1 is supported by the manuscript or references. I would recommend simplifying the figure.
- Ranvier nodes are not cells, yet they are presented under "Cell name" in Table 1.
- When you performed literature search in PubMed/MEDLINE, Embase and CINAHL, please specify if there were language restrictions, approximate date of the final search for example.
- Language and grammar require extensive editing.
- I recommend avoiding subjective language with phrases such as: "most promising approach"; "brilliantly synthesized"; etc.
- You should define every abbreviation consistently.
- The reference list should be checked for completeness and bibliographic accuracy.