ABSTRACT

Adv Ther. 2022 Jan;39(1):165-177. doi: 10.1007/s12325-021-01977-3. Epub 2021 Dec 1.

Clinical and Molecular Features of Patients with Gliomas Harboring IDH1 Non-canonical Mutations: A Systematic Review and Meta-Analysis.

Di Nunno V(1), Franceschi E(2), Tosoni A(3), Gatto L(1), Maggio I(1), Lodi R(4)(5), Angelini D(3), Bartolini S(3), Brandes AA(3).

Author information:
(1)Department of Oncology, AUSL Bologna, Bologna, Italy.
(2)Nervous System Medical Oncology Department, IRCCS Istituto Scienze Neurologiche, Via Altura 3, Bologna, Italy. enricofra@yahoo.it.
(3)Nervous System Medical Oncology Department, IRCCS Istituto Scienze Neurologiche, Via Altura 3, Bologna, Italy.
(4)IRCCS Istituto delle Scienze Neuroradiologiche di Bologna, Bologna, Italy.
(5)Department of Biomedical and Neuromotor Sciences, University of Bologna, Bologna, Italy.

INTRODUCTION: The canonical isocitrate dehydrogenase 1 R132 mutation (IDH1 R132) is the most frequent mutation among IDH-mutated gliomas. Non-canonical IDH1 mutations or IDH2 mutations are unusual and their clinical and biological role is still unclear.

METHODS: We performed a systematic review and meta-analysis to assess the clinical role of IDH non-canonical mutations.

RESULTS: Overall, we selected 13 of 3513 studies reporting data of 4007 patients with a diagnosis of grade 2 and grade 3 glioma including 3091 patients with a molecularly proven IDH1 or IDH2 mutation. Patients with non-canonical IDH1 mutations were younger and presented a higher DNA methylation level as compared to those with canonical IDH1 R132H alteration. The overall incidence of non-canonical IDH1 mutations was 7.9% (95% CI 5.4-10.7%) in patients with IDH-mutated gliomas. There was no statistical difference in terms of incidence between patients with grade 2 or grade 3 glioma. Patients with non-canonical IDH mutations had a lower rate of 1p19q codeletion (risk difference 31%, 95% CI 23-38%) and presented a significantly prolonged survival (pooled HR 0.47, 95% CI 0.28-0.81) as compared to those with IDH1 R132H mutation.

CONCLUSION: Non-canonical IDH1 mutations occur in 7.9% of IDH-mutated gliomas and identify a specific subgroup of patients with an improved survival despite a lower rate of 1p19q codeletion. Data about the type of IDH mutation should be collected in clinical practice and within interventional trials as this could be a critical variable for improved stratification and selection of patients.

DOI: 10.1007/s12325-021-01977-3
PMID: 34853984 [Indexed for MEDLINE]