Alendronate for glioblastoma

Tricarico et al. analyzed the effect of Alendronate (ALD) treatment in glial cells, the main sources of cholesterol for neurons and principal cells involved in the immunological defense of the brain. We treated a glial cell line (U87-MG) with increasing doses of ALD (0.1, 1, 10, 25, 50 µM) for 48 h, aimed at evaluating the influence of this drug treatment on IL-1B expression, NLRP3 and CASP1 expression, mitochondrial activity and apoptotic cell death. We observed that ALD treatment, at the higher concentrations, induced a significant increase of IL-1B, NLRP3, CASP1 expression, provoked apoptosis and also mitochondrial damage in U87-MG. Considering the reported CNS adverse outcomes of NBPs treatment, our results confirm ALD side-effects on glial cell model [1].

Alendronate and zoledronate, significantly reduced the formation of glioblastoma spheres, and alendronate was effective at a lower molar concentration than zoledronate. Knockdown of FDPS using short hairpin RNA also completely inhibited the formation of secondary spheres. FDPS mRNA in patients with glioblastoma was associated with malignancy in three independent microarray data sets. RNA sequencing showed that alendronate treatment reduced the embryonic stem cell signature and activated development- and necrosis-related pathways in glioblastoma spheres. These results suggest that FDPS is important for the maintenance of glioblastoma stemness and that alendronate, a drug widely used to treat osteoporosis, can be repositioned to treat glioblastoma [2]

References

1)
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