StArt - State of the Art through Systematic Review

Approaches to improve the therapeutic effects of mesenchymal stromal cell-derived extracellular vesicles in bone regeneration – a systematic review

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Title:	Approaches to improve the therapeutic effects of mesenchymal stromal cell-derived extracellular vesicles in bone regeneration – a systematic review
Researchers:	Fernanda Campos Hertel
Objectives:	Ponctuate and assess the methodology used to improve the therapeutic abilyties of mesenchymal stromal cells derived extracellular vesicles
Main Question:	Does the conditioning of MSCs improve the therapeutic effects of MSC-derived EVs for bone regeneration?
Intervention:	Treatment with EVs derived from preconditioned MSCs
Control:	Treatment withl EVs without conditioning
Population:	in vivo or in vitro studies with a focus on osteogenesis/bone regeneration
Results:	osteogenesis/angiogenesis for in vitro and in vivo studies
Keywords:	MSC; bone healing; bone regeneration; bone repair; exosome; extracellular vesicles; fracture; mesenchymal stem cells; mesenchymal stromal cells
Source Selection Criteria:	specific database; broad-ranging database;
Studies Languages:	English;
Source Search Methods:	Included in the manuscript apendix
Source Engine:	PubMed; Web of Science; Scopus;
Studies inclusion and exclusion criterias:	(E) articles that reported the use of EVs from other cells sources than MSCs; (E) articles that reported the use of an animal model with induced disease (as osteoporosis, obesity, femoral head necrosis, periodontal related diseases); (E) articles that did not use EVs as treatment; (E) treatment associating MSCs with EVs; (E) articles that did not report a control group of EVs; (E) articles that did not report conditioning of MSCs; (E) review articles, conference abstracts; (I) articles that reported the treatment with pre-conditioned MSC-derived EVs in vitro and/or in vivo; (I) ; articles that reported the assessment of osteogenesis in vitro and/or in vivo;
Studies types definition:	All types, if the inclusion criteria was met.;
Initial studies selection:	Based on title and abstract;
Information Extraction Fields:	Journal; Country; year of publication; Type of MSC; Species of MSC; Type of vesicle=[exosome,extracellular vesicle,microvesicles]; Type of conditioning method?; Scaffolf? ={yes,no}; Type of scaffold; Isolation method; Characterization methods; Type of study=[in vitro,in vivo]; In vitro: celular type for in vitro analysis; In vitro assays; Animal model; in vivo: type of defect; treatment groups for in vivo analysis; Extracellular vesicles concentration; vehicle for in vivo application; in vivo delivery route; application frequency; time of euthanasia; Types of in vivo analysis; in vitro outcome: uptake; in vitro outcome: proliferation assay; in vitro outcome: osteogenic differentiation; in vitro outcome: scratch wound assay; in vitro outcome: osteogenic markers; in vitro outcome: miRNAs exosomal; in vivo outcome: microct; in vivo outcome: x-ray; in vivo outcome: histology; in vivo outcome: IHC; in vivo outcome: immunofluorescence;
Results Summarization:	Descriptive, tables and figures;