

#### RATIONALE/JUSTIFICATION

The investigation of biologic properties of newly introduced calcium silicate materials is of utmost importance for their use in clinical practice towards the preservation of pulp tissue during vital pulp treatment procedures

#### AIM/HYPOTHESIS

To evaluate the effects of NeoMTA®2, ProRoot® MTA and TotalFill® BC RRM™ putty in terms of cells attachment and proliferation as well as biomineralization potential of human dental pulp cells (hDPCs).

#### ETHICAL APPROVAL (IF APPLICABLE)

The protocol of the study was approved by the Research Ethics Committee of the School of Dentistry, and written consent was obtained from all the participants.

#### SAMPLES

Human dental pulp cells derived from dental pulps of third mandibular molars

#### EXPERIMENTAL AND CONTROL GROUPS, INCLUDE INDEPENDENT VARIABLES

Three experimental groups were used according to the three tested materials. A control group was used consisted of cells from the same culture, which were grown on plastic culture surfaces and evaluated for the same time periods.

#### OUTCOME(S) ASSESSED, INCLUDE DEPENDENT VARIABLES AND TYPE

Cell attachment and proliferation, gene expression analysis assessed at three different time periods. Gene expression analysis included the quantification of the following genes: alkaline phosphatase (ALP), osteocalcin (OCN), collagen alpha-1 type I (COL1A1), dentin sialophosphoprotein (DSPP), dentin matrix acidic phosphoprotein-1 (DMP-1), nestin, and the transcription factor core-binding factor alpha-1 (Cbfa-1 or Runx-2)

#### METHOD USED TO ASSESS THE OUTCOME (S) AND WHO ASSESSED THE OUTCOME(S)

MTT assay, Real-Time PCR, Scanning electron microscopy. All outcomes were assessed by the authors of the present study

#### RESULTS

MTT median values in all materials were statistically significantly higher in 72 hours compared to 24 and 48 hours. Gene expression analysis showed that NeoMTA®2 induced significantly higher Alkaline Phosphatase (ALP) and Osteocalcin (OCN) levels by day 7 compared to both two other tested materials. SEM images confirmed abundant, well-attached and functional cells across all materials.

#### CONCLUSION(S)

NeoMTA®2 seems to promote similar or even better cellular responses compared to ProRoot® MTA and TotalFill® BC RRM™ putty favoring cellular attachment and proliferation, and gene expression related to mineralization and odontogenesis.

#### FUNDING DETAILS

No funding is associated with the present study

#### CONFLICT OF INTEREST

None