ABSTRACT

HEMA AND MMA IN ETANOL SOLVENT APLICATION EFFECT IN NUCLEAR FACTOR KAPPA BETA (NF-κß) AND TYPE 1 COLAGEN EXPRESION IN WISTAR RAT ODONTOBLAS CELL

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ABSTRACT

Background: HEMA and MMA which commonly used in dentin bonding have so many good effects in terms of enhancing bonding strength, but both of it are known to be able to cause inflammation.

Objective: Evaluating of the effect of HEMA and MMA with ethanol solvent on its capability to cause inflammation in odontoblast cells which is represented by expression of NFkB and Collagen type 1 in rat teeth model.

Material and Methods: This experimental study using a total of 30 maxillary first molar of wistar rat which then randomly divided into experimental combination of HEMA group, MMA group, and negative control group. The cavities then sealed with Cention. After 1 and 3 days, rats then sacrificed from each group, and sections of the teeth were obtained. After being decalcified, specimens underwent histological evaluation under light microscope to identify the presence of odontoblast-like cell. The immunohistochemistry (IHC) method using anti-NFkB and anti-Collagen type 1 was then performed to evaluate the expression of NFkB and Collagen type 1. The results then statistically evaluated by Kolmogorrov Smirnov, Levene's, and one way ANNOVA tests.

Results: MMA with ethanol solvent group to shows the most cells expressing NFkB and shows the least cells expressing Collagen type 1, followed by HEMA group, and negative control group as the least group expressing NFkB and the most group expressing Collagen type 1

Conclusion: HEMA and MMA with etanol solvent can cause inflammation. MMA cause greater inflammation than HEMA in terms of cells expressing NFkb and Collagen type 1

Keywords: *Hema, MMA, NF-κß, Collagen type 1*

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DAFTAR SINGKATAN

Bis-GMA	= *Bisphenol A glycidyl methacrylate*
DAB	= *Diamino Benzidine*
DC	= *Degree of Conversion*
DNA	= *Deoxyribonucleic acid*
DPSC	= *Dental pulp stem cell*
DSPP	= *Dentin sialophosphoprotein*
ECM	= *Extracellular matrix*
EDTA	= *Ethylenediaminetetraacetic acid*
FBS	= *Fetal bovine serum*
HE	= *Hematoxilen eosin*
HEMA	= *2-hydroxyethyl methacrylate*
HPA	= Histopatologi anatomi
HSD	= *Honestly significant difference*
IHK	= Imunohistokimia
IkB	= *Inhibitor kappa beta*
IkK	= *Inhibitor kappa betakinase*
IL-1	= *Interleukin-1*
ISO	= *International Organization for Standardization*
MMA	= *Methyl Methacrylate*
MMP1	= *Matrix Metalloproteinase 1*
NF-κB	= *Nuclear factor kappa B*
OLC	= *Odontoblast-like cell*
PAMPs	= *Pathogen-associated molecular patterns*

PBS = *Phosphate buffered saline*

PMN = *Polymorphonuclear leukocyte*

PRR = *pattern-recognition rceptors*

RANKL = *Receptor activator of nuclear factor kappa-B ligand*

SC = *Stem cell*

SD = Standar deviasi

TEGDMA = *Triethylene glycol dimethacrylate*

TGFβ = *Transforming growth factor beta*

TLR2 = *Toll like receptor-2*

TLR4 = *Toll like receptor-4*

TNFα = *Tumor necrosis factor alpha*

TNSFS3 = *Tumor necrosis factor ligand superfamily member 3*

TNSFS5 = *Tumor necrosis factor ligand superfamily member 5*

TNSFS11 = *Tumor necrosis factor ligand superfamily member 11*

UDMA = *Urethane dimethacrylate*