

## Peran nutrisi dan kegagalan autofagi pada preeklamsia = Role of nutrition and autophagy failure in pathomechanism of preeclampsia

Hutabarat, Martina, author

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### Abstrak

#### <b>ABSTRAK</b><br>

Preeklamsia merupakan masalah kesehatan maternal yang berdampak luas pada kesehatan manusia. Defek plasentasi merupakan faktor predisposisi utama preeklamsia yang mengakibatkan spektrum kematian sel apoptosis, aponekrosis dan autofagi. Autofagi juga berperan sebagai mekanisme ketahanan selular melalui nutrisi sebagai regulator utama. Penelitian ini bertujuan untuk mengetahui peran nutrisi dan autofagi sebagai ketahanan selular pada patomekanisme preeklamsia. Penelitian ini merupakan penelitian dengan desain potong lintang yang dilakukan terhadap 4 kelompok yakni; hamil normal, preeklamsia awitan lanjut, preeklamsia awitan dini dan PJT dengan jumlah sampel 10 pasien tiap kelompok. Dilakukan analisis nutrisi secara kualitatif dan kuantitatif untuk zat nutrisi vitamin D, kalsium dan seng serta zat nutrisi sebagai marka inflamasi yaitu vitamin A dan mineral besi. Dilakukan pemeriksaan marka kematian sel LDH dan pemeriksaan marka autofagi LC3, Beclin-1, kegagalan autofagi rasio LC3/Beclin-1 serta marka nutrisi plasenta VDR. Selama periode Agustus hingga Oktober 2015 terdapat 40 pasien yang mengikuti penelitian di RSUPN Cipto Mangunkusumo dan RS Budi Kemuliaan Jakarta. Terdapat perbedaan bermakna ekspresi LC3 dan Beclin-1 serta rasio LC3/Beclin-1 di antara kelompok penelitian. Kelompok preeklamsia awitan dini dan PJT memiliki ekspresi LC3 dan Beclin-1 tertinggi, sedangkan kelompok hamil normal dan preeklamsia awitan lanjut memiliki rasio LC3/Beclin-1 tertinggi. Terdapat korelasi antara kegagalan autofagi dengan LDH. Terdapat defisiensi vitamin D, kalsium dan seng serta terdapat peningkatan retinol dan ferrum sebagai marka inflamasi pada kelompok kehamilan patologis. Terdapat mekanisme up regulation ekspresi nutrisi plasenta reseptor vitamin D VDR pada kelompok preeklamsia awitan lanjut dan awitan dini, sementara ditemukan ekspresi VDR yang rendah pada kelompok PJT. Terdapat korelasi negatif antara rasio LC3/Beclin-1 dengan marka nutrisi maternal terutama kelompok preeklamsia awitan lanjut dan awitan dini. Terdapat korelasi bermakna antara rasio LC3/Beclin-1 dengan ekspresi VDR sebagai marka nutrisi plasenta pada kelompok preeklamsia awitan dini. Autofagi berperan dalam proses kematian sel dan ketahanan selular trofoblas. Terdapat peran nutrisi yang berkorelasi dengan proses autofagi pada patomekanisme preeklamsia. Kata kunci : Autofagi, kematian sel, ketahanan selular, nutrisi, preeklamsia.

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#### <b>ABSTRACT</b><br>

Preeclampsia is a maternal health problem which largely affects human well being. Placentation defects is the main predisposition factor of preeclampsia which cause cell death spectrum of apoptotic, aponecrosis, and autophagy. Autophagy also has a role as cellular survival mechanism as well through nutrition as main regulator. This research aims to understand the roles of nutrition and autophagy as cellular survival in pathomechanism of preeclampsia. The research has cross sectional study design which was conducted to four groups of pregnancy normal pregnancy, late onset preeclampsia, early onset preeclampsia, and intrauterine growth restriction IUGR with 10 samples for each group. Qualitative and quantitative nutrition

analysis was done for vitamin D, calcium and zinc. The same methods was done to nutrients as inflammatory markers which is vitamin A and iron. Assessment was done for cell death marker LDH, autophagy markers LC3, Beclin 1, autophagy failure ratio of LC3 Beclin 1, and placenta nutrition marker VDR. During the period of August to October 2015 there were 40 patients participated in research which was conducted in RSUPN Cipto Mangunkusumo and RS Budi Kemuliaan Jakarta. Analysis shows statistically significant difference between groups of the expression of LC3 and Beclin 1 and ratio of LC3 Beclin 1 as well. Early onset preeclampsia and IUGR group showed the highest LC3 and Beclin 1 expression, while normal pregnancy and late onset preeclampsia group showed the highest ratio of LC3 Beclin 1. There was a correlation between autophagy failure and LDH. There were deficiencies of vitamin D, calcium and zinc and the increase of retinol and iron as inflammatory markers in pathological pregnancy. There was up regulation of vitamin D receptor VDR expression in early and late onset preeclampsia, while low expression of VDR in placenta of IUGR group. There was negative correlation between ratio of LC3 Beclin 1 and maternal nutrition markers particularly in preeclampsia group. There was significant correlation between the ratio of LC3 Beclin 1 and expression of placenta VDR as nutrition marker in early onset preeclampsia group. Autophagy plays a role in the spectrum of cell death and cellular survival in trophoblast. There is role of nutrition in correlation with autophagy process in pathomechanism of preeclampsia

Keywords Autophagy, cell death, cellular survival, nutrition, preeclampsia