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Epidermal growth factor polymorphism most prevalent in stage II cervical carcinoma

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ABSTRACT

BACKGROUND
Cervical cancer ranks second among female cancers worldwide and is widely associated with human papilloma virus (HPV) infection. However, HPV infection progression is influenced by various host factors. Epidermal growth factor (EGF) is a host factor important for proper epithelial proliferation and development, and may play a role in cervical cancer progression. A functional A61G polymorphism in the EGF gene has been hypothesized to alter EGF concentration in vivo with increasing guanine content associated with greater EGF level. However, a map of A61G polymorphism distribution is not available for any population, including Indonesia. This study aims to determine the distribution of EGF A61G polymorphism among cervical cancer patients at Dr. Hasan Sadikin General Hospital.

METHODS
A retrospective cross-sectional study was conducted between July-November 2010. Included were 61 cervical cancer patients of various stages at Dr. Hasan Sadikin hospital, who had previously undergone blood sample collection, DNA isolation and finally genotyping for EGF gene using Illumina BeadXpress®. Chi-square test was used to analyse the data.

RESULTS
The EGF A61G polymorphism was exhibited by 88.5% of patients (as genotypes A/G and G/G). The majority of patients with this polymorphism were of moderate severity (FIGO stage II and III, 42.6% and 38.1% respectively). Patients with the polymorphism but with the lightest severity (FIGO stage I) accounted for 22.2% of the population.

CONCLUSION
EGF A61G polymorphism affected the majority of cervical cancer patients and that once stratified, the patients showed intermediate severity in terms of their cancerous growth.

Keywords: Cervical cancer, EGF, A61G polymorphism

Polimorfisme A61G pada gen EGF paling banyak pada karsinoma serviks stadium II

ABSTRAK

LATAR BELAKANG

Kanker serviks merupakan kanker kedua terbanyak pada perempuan di seluruh kanker serviks hampir selalu diasosiasikan dengan infeksi human papilloma virus *(HPV). Akan tetapi, berbagai faktor penjamu (*host*) telah dibuktikan dibutuhkan untuk memungkinkan progresi infeksi ini kedalam suatu massa neoplastic.* Epidermal growth factor *(EGF) merupakan sebuah faktor pertumbuhan dari penjamu yang diperlukan untuk proliferasi dan diferensiasi dari jaringan epitel. Sebuah polimorfisme A61G fungsional pada gen EGF diduga dapat mengubah konsentrasi EGF* in vivo *di mana konsentrasi guanin yang lebih tinggi pada genotip seseorang dikaitkan dengan konsentrasi EGF yang lebih besar pula. Akan tetapi, hingga sekarang belum ada peta distribusi polimorfisme A61G untuk populasi Indonesia. Penelitian ini bertujuan untuk menentukan distribusi polimorfisme A61G pada pasien kanker serviks stadium I-IV di Rumah Sakit Dr. Hasan Sadikin. Uji* chi-square *digunakan untuk analisis data.*

METODE

Sebuah rancangan potong silang dilakukan antara bulan Juli-November 2010. Pengambilan darah serta isolasi DNA dilakukan pada 61 pasien kanker serviks dengan berbagai stadium di RS Dr. Hasan Sadikin dan kemudian, uji genotyping untuk gen EGF menggunakan BeadXpress® Illumina.

HASIL

Hasil analisis menunjukkan bahwa polimorfisme A61G dimiliki oleh 88,5% pasien (dengan genotip A/G dan G/G). Di antara pasien-pasien yang memiliki polimorfisme ini, mayoritas memiliki tingkat keparahan sedang (stadium II dan III FIGO, 42,6% dan 31,8%). Kemudian, hanya 22,2% pasien dengan polimorfisme ini yang memiliki tingkat keparahan ringan.

KESIMPULAN

Penelitian ini menunjukkan bahwa polimorfisme A61G pada gen EGF meliputi mayoritas pasien kanker serviks dan setelah distratifikasi, mayoritas pasien menunjukkan tingkat keparahan sedang.

Kata kunci: *Kanker serviks, EGF, polimorfisme A61G*

INTRODUCTION

Cervical cancer forms a huge burden in the epidemiology of female cancer, as it currently ranks second worldwide. Its prevalence is estimated at 500,000 cases, with 270,000 deaths annually.[1] Southeast Asia, Sub-Saharan Africa and South America today form the hot zones for high HPV prevalence. In Indonesia, cervical cancer reached a crude incidence rate of 12.1 per 100,000 women back in 2008 and this corresponds to more than 13,000 cases of new cervical cancer cases every year in Indonesia alone.[2] Cervical cancer, as any other type of cancer, requires both host and environmental factors. The human papilloma virus is the prerequisite environmental factor and both single and multiple HPV infections in a single patient is no longer an oddity.[3] In fact, from a local study done at Dr. Hasan Sadikin General Hospital, HPV 16 is the most prevalent virus among patients, followed by HPV 18, 45 and 52.[3] Once the virus infects the cervical epithelial cells, it then has its genes expressed and mature viral particles synthesized via the expression of various early proteins, namely E5, E6 and E7