ABSTRAK

VALIDASI PEMBUATAN HEWAN MODEL KANKER PAYUDARA MENGGUNAKAN MENCIT C3H DIINDUKSI SEL 4T1: PERUBAHAN MAKROSKOPIS DAN HISTOPATOLOGI PEWARNAAN HEMATOKSILIN-EOSIN

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Kanker payudara menjadi ancaman global bagi wanita. Setiap wanita berpotensi menderita kanker payudara meskipun tidak ditemukan riwayat kanker tersebut dalam keluarga. Terapi kanker payudara umum dilakukan dengan kemoterapi dan pemberian obat herbal, tetapi obat herbal untuk kanker payudara di Indonesia belum dilakukan standardisasi. Uji toksisitas dan praklinik secara *in vivo* perlu dilakukan agar obat herbal dapat diakui sebagai fitofarmaka. Pengujian tersebut membutuhkan pemahaman terkait pembuatan hewan model. Penelitian ini dilakukan dengan membuat hewan model kanker payudara menggunakan mencit C3H diinduksi sel 4T1. Mencit C3H dipilih sebagai hewan model kanker payudara karena mampu menimbulkan tumor secara spontan terutama pada kelenjar mammae. Sel 4T1 digunakan sebagai penginduksi karena bersifat invasi, tumorigenik, dan mampu bermetastasis. Penelitian ini memiliki *ethical clearance* dengan nomor 74/EC-FKH/int./2024. Mencit C3H betina sebanyak 6 ekor berumur 10 minggu dengan berat badan berkisar antara 22 sampai 25 g dibagi menjadi dua kelompok. Kelompok kontrol negatif berisi tiga ekor mencit, sedangkan tiga ekor mencit lainnya merupakan kontrol positif diinduksi sel 4T1. Mencit diinduksi suspensi sel 4T1 sebanyak 0,1 ml menggunakan *syringe* ukuran 1 ml dengan jarum 27G pada kelenjar mammae sinister baris ke-4. Hewan model dilakukan monitoring dan pengukuran tumor menggunakan jangka sorong selama empat minggu. Hewan model dieutanasia dengan dislokasi *cervix*. Sampel jaringan kelenjar mammae dipreparasi untuk membuat preparat histopatologi dengan pewarnaan HE. Hasil monitoring pertumbuhan tumor menunjukkan ukuran tumor mengalami kenaikan hingga hari ke-13 paskainduksi. Tumor selanjutnya mengalami regresi dan tidak dapat dipalpasi serta diukur kembali. Hasil histopatologi kelenjar mammae hewan model kanker payudara dengan pewarnaan HE menunjukkan epitel duktus dan alveoli mengalami hiperplasia, displasia, *nuclear pleomorphism*, serta terdapat sekret *microcystic eosinophilic* dalam lumen duktus. Imunitas menjadi faktor terjadinya regresi tumor, tetapi induksi sel 4T1 tetap memengaruhi abnormalitas aktvitas sel sehingga epitel terus berproliferasi. Penelitian ini memerlukan pengujian molekuler untuk mengetahui gen yang terlibat dalam pembentukan tumor.

Kata kunci: Histopatologi, kelenjar mammae, mencit C3H, sel 4T1, tumor

ABSTRACT

VALIDATION OF BREAST CANCER MODEL USING C3H MICE INDUCED WITH 4T1 CELLS: MACROSCOPIC AND HISTOPATHOLOGICAL CHANGES WITH HEMATOXYLIN-EOSIN STAINING

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Breast cancer is a global threat to women. Every women potentially suffer from breast cancer even there is no history of the disease in family. Breast cancer therapy commonly uses chemotherapy and herbal medicine, but herbal medicine for breast cancer in Indonesia has not been standardized. Toxicity and preclinical testing by in vivo needed so herbal medicine can be recognized as phytopharmaceuticals. These testings require an understanding of animal model creation. This research was conducted by creating breast cancer models using C3H mice induced with 4T1 cells. C3H mice were chosen because it can spontaneously develop tumors especially in mammary glands. 4T1 cells are used as inducer because it is invasive, tumorigenic, and capable to metastasizing. This research has ethical clearance 74/EC-FKH/int./2024. Total of 6 female C3H mice aged 10 weeks with weight between 22 to 25 grams were divided into two groups. Negative control consisted of three mice, while other three mice as positive control induced with 4T1 cells. Mice were induced with 0,1 ml suspension of 4T1 cells using a 1 ml syringe with 27G needle into the fourth row of left mammary gland. Breast cancer models were monitored and tumor measured by caliper for four weeks. Euthanized is using cervical dislocation. Mammary gland tissue samples were prepared to create histopathological slide using HE staining. Results of tumor growth showed tumor size increased until day 13 postinduction. Tumor subsequently regressed and could not be palpated or measured again. Histopathological results of mammary glands showed duct and alveolar epithelium changed with hyperplasia, dysplasia, nuclear pleomorphism, and microcystic eosinophilic secretions in lumen of the ducts. Immunity become a factor in tumor regression, but 4T1 cells induction still affects the abnormal activity of cells, causing epithelium to continue proliferating. Molecular testing required to identify the genes involved in tumor formation.

Keywords: 4T1 cells, breast cancer, C3H mice, histopathology, tumor