

ABSTRACT

Background : Tissue clearing is the process of replacing the dehydration solution with a substance that is miscible with alcohol and paraffin. Xylene is the standard clearing agent in tissue preparation, but it is toxic, so safer alternative clearing agents are needed. Coconut oil has the potential to be used as an alternative clearing agent because it is nonpolar like xylene, but it requires heating to reduce its viscosity.

Objective : To determine the histomorphology of liver tissue, including the clarity of the cell nuclei, the clarity of the cytoplasm, and the uniformity of hematoxylin-eosin staining of liver tissue using coconut oil both without heating and heated to 40°C as a clearing agent.

Methods : This study employed a quasi-experimental design with a post-test-only control group. The sample, consisting of Wistar rat liver tissue, was divided into three groups each cleared using xylene, coconut oil without heating, and coconut oil heated to 40°C. Histomorphological quality was assessed based on nuclear clarity, cytoplasmic clarity, and uniformity of staining using a scoring system and was then analyzed descriptively by a specialist in Anatomical Pathology.

Results : The xylene group yielded the best results, with an average score of 2.98 (100% good nuclear and cytoplasmic staining; 93.33% good overall staining). The coconut oil group without heating showed results close to the control group, with an average score of 2.84 (cell nuclei: 93.33% good; cytoplasm and staining: 86.67% good). Meanwhile, the coconut oil group heated to 40°C produced the lowest average score of 2.42. Although the uniformity of staining (73.33%) and the clarity of the cell nucleus (60%) were still categorized as “good” in most fields of view, the quality of the cytoplasm in this group was predominantly categorized as “poor,” accounting for 93.33% of the fields of view.

Conclusion : The use of coconut oil for clearing without heating produced good-quality hematoxylin-eosin staining of liver histomorphology across all test parameters (cell nuclei, cytoplasm, and uniformity of staining), whereas heating at 40°C resulted in good staining of cell nuclei but poorer staining of the cytoplasm.

Keywords : Coconut oil, xylene, clearing agent, liver histomorphology

ABSTRAK

Latar Belakang : Penjernihan jaringan merupakan proses penggantian larutan dehidrasi dengan zat yang dapat bercampur dengan alkohol dan parafin. Xylene merupakan agen penjernih standar pada preparasi jaringan, namun bersifat toksik sehingga diperlukan agen penjernih alternatif yang lebih aman. Minyak kelapa berpotensi digunakan sebagai agen penjernih alternatif karena bersifat non-polar seperti xylene, namun memerlukan pemanasan untuk menurunkan viskositasnya.

Tujuan : Mengetahui histomorfologi jaringan hepar meliputi kejelasan inti sel, kejelasan sitoplasma dan keseragaman pewarnaan hematoksilin eosin terhadap jaringan hepar menggunakan minyak kelapa tanpa pemanasan dan dengan pemanasan 40°C sebagai agen penjernih.

Metode Penelitian : Penelitian ini menggunakan *quasi experimental* dengan desain *post-test only control group design*. Sampel berupa jaringan hepar tikus wistar dibagi menjadi tiga kelompok, yaitu penjernihan menggunakan xylene, minyak kelapa tanpa pemanasan dan minyak kelapa dengan pemanasan 40°C. Kualitas histomorfologi dinilai berdasarkan kejelasan inti sel, kejelasan sitoplasma, dan keseragaman pewarnaan menggunakan sistem skor kemudian dianalisis secara deskriptif oleh dokter spesialis Patologi Anatomi.

Hasil Penelitian : Kelompok xylene memberikan hasil terbaik dengan rerata skor 2,98 (inti sel dan sitoplasma baik 100%; pewarnaan baik 93,33%). Kelompok minyak kelapa tanpa pemanasan menunjukkan hasil yang mendekati kontrol dengan rerata skor 2,84 (inti sel baik 93,33%, sitoplasma dan pewarnaan baik 86,67%). Sementara itu, kelompok minyak kelapa dengan pemanasan 40°C menghasilkan rerata skor terendah yaitu 2,42. Meskipun keseragaman pewarnaan (73,33%) dan kejelasan inti sel (60%) masih berkategori baik pada sebagian besar lapang pandang, kualitas sitoplasma kelompok ini didominasi oleh kategori kurang baik hingga mencapai 93,33% lapang pandang.

Kesimpulan : Pemanfaatan penjernihan menggunakan minyak kelapa tanpa pemanasan menghasilkan kualitas pewarnaan hematoksilin eosin histomorfologi hepar yang baik pada semua parameter uji (inti sel, sitoplasma dan keseragaman pewarnaan), sedangkan pemanasan 40°C menghasilkan inti sel dan pewarnaan yang baik tetapi kualitas sitoplasma kurang baik.

Kata Kunci : Minyak kelapa, xylene, agen penjernih, histomorfologi hepar