

Perubahan ekspresi tenascin-C, jumlah, dan diameter serat otot gastrocnemius dan soleus Tikus usia 1 hari 3 bulan, dan 12 bulan = Changes in expression of tenascin-C, muscle fiber number and diameter of gastrocnemius and soleus muscles in rats aged 1 day, 3 months, and 12 months

Veronika Maria Sidharta, author

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Abstrak

Latar belakang: Otot rangka adalah jaringan yang dinamis. Proses perkembangan dan regenerasinya dipengaruhi oleh berbagai faktor pertumbuhan, antara lain tenascin-C. Tenascin-C adalah suatu glikoprotein heksabromon matriks ekstrasel yang mempunyai subunit EGF-like. Tenascin-C berfungsi sebagai regulator berbagai fungsi sel. Ekspresinya dapat dilihat dengan cara imunohistokimia dan dinilai secara semikuantitatif dengan estimasi visual. Belum diketahui ekspresi tenascin-C pada jaringan otot rangka berkaitan dengan proses perkembangan dan korelasinya dengan jumlah dan diameter serat otot rangka. Diduga seiring bertambahnya usia akan terjadi penurunan ekspresi tenascin-C dan bertambahnya jumlah dan diameter serat otot. Diharapkan di kemudian hari dapat dikembangkan terapi kerusakan atau kelainan otot melalui optimalisasi regenerasi otot dengan pemberian tenascin-C eksogen.

Metode: Desain penelitian ini adalah perbandingan potong lintang dengan subyek tikus Sprague-Dawley jantan usia 1-4 hari, 3-4 bulan, dan 12-16 bulan. Sediaan mikroskopik diwarnai dengan hematoxilin eosin TNC. Fotomikrograf dianalisis dengan Digimizer Image Analyzer. Analisis imunoreaktivitas TNC dilakukan berdasarkan intensitas pewarnaan dan pola ekspresi.

Hasil: Terdapat penambahan jumlah dan diameter serat otot rangka dari kelompok usia 1-4 hari sampai kelompok usia 12-16 bulan. Ekspresi TNC ditemukan pada otot rangka semua kelompok umur. Ekspresi kuat terhadap TNC paling sering ditemukan di kelompok usia 1-4 hari. Ekspresi negatif dan ekspresi lemah paling sering ditemukan di kelompok usia 12-16 bulan.

Background: Skeletal muscle is a dynamic tissue. Its development and regeneration processes are influenced by various growth factors. Amongst those factors is tenascin C. TNC is one of the extracellular matrix glycoprotein with EGF-like subunit. TNC acts as regulator for several cell functions. Its expression can be detected immunohistochemically and analyzed semiquantitatively using visual estimation. TNC expression in skeletal muscle related with developmental process and its correlation with skeletal muscle fiber number and diameter is, to date, not yet known. The preferred hypothesis is with increasing age, there will be decreasing TNC expression and increment of skeletal muscle fiber number and diameter.

Methods: This is a comparative cross-sectional study. Subjects are male Sprague-Dawley rats, divided into 3 age groups: 1-4 days, 3-4 months, and 12-16 months. Microscopic specimens were made and stained with hematoxylin-eosin and TNC immunohistochemistry. Microphotographs were analysed using Digimizer Image Analyzer. Immunoreactivity of TNC was classified based on staining intensity and expression pattern.

Result: There is an increase in skeletal muscle fiber number and diameter from 1 day to 16 months. TNC expression was positive in all age groups. Strong TNC expression was found in 1-4 day-old group. Negative and weak expressions were found mostly in adult group. There is a positive correlation between TNC

extracell expression pattern with muscle fiber number and diameter, and also between TNC weak expression with muscle fiber number and diameter.