Korelasi rasio perubahan pennation angle otot rektus femoris dengan rasio perubahan tebal otot diafragma menggunakan ultrasonografi pada pasien yang dirawat di intensive care unit menggunakan ventilasi mekanik = The Correlation of the changing ratio of pennation angle of the rectus femoris muscles with the changing ratio of diaphragm muscle thickness using ultrasonography in patients treated in intensive care unit using mechanical ventilation

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Abstrak

Latar Belakang: Angka mortalitas penyakit kritis menurun di seluruh dunia, namun pasien yang selamat mengalami disabilitas fungsional yang signifikan akibat penghancuran otot. Kelemahan otot yang terjadi pada pasien ICU (Intensive Care Unit) ini disebut sebagai ICU-AW (Intensive Care Unit Acquired Weakness). Penilaian tebal otot diafragma telah dipakai untuk memprediksi usaha napas dan penggunaan ventilator. Pennation angle merupakan pola susunan serat otot dalam hubungannya dengan aksis otot yang berfungsi sebagai penghasil kekuatan otot.
Tujuan: Tujuan penelitian ini adalah untuk menentukan perubahan pennation angle otot rektus femoris yang berhubungan terhadap perubahan tebal otot diafragma.
Metode: Sebanyak 34 subjek penelitian yang dirawat di Intensive Care Unit dengan menggunakan ventilasi mekanik, dilakukan penghitungan tebal otot diafragma dan pennation angle otot rektus femoris hari pertama hingga hari kelima perawatan menggunakan ultrasonografi. Kemudian dihitung rasio perubahan pennation angle otot rektus femoris dan perubahan tebal otot diafragma serta dilakukan analisa korelasi.
Hasil: Tidak terdapat korelasi antara rasio perubahan pennation angle otot rektus femoris dengan rasio perubahan tebal otot diafragma hari kedua hingga kelima (R = 0,041 - 0,211, p = 0,231 - 0,816). Terdapat korelasi sedang hingga kuat antara rasio perubahan pennation angle otot rektus femoris hari kedua hingga kelima dengan pennation angle otot rektus femoris hari pertama (R = -0,615 hingga -0,777, p = 0,001). Terdapat korelasi sedang hingga kuat antara rasio perubahan pennation angle otot rektus femoris hari kedua hingga kelima dengan pennation angle otot rektus femoris hari kedua hingga kelima (R = 0,471 - 0,728, p = 0,001 - 0,005). Terdapat korelasi sedang hingga kuat antara rasio perubahan tebal otot diafragma hari kedua hingga kelima dengan tebal otot diafragma hari pertama (R = -0,538 hingga -0,710, p = 0,001).
Kesimpulan: Tidak terdapat korelasi antara rasio perubahan pennation angle otot rektus femoris dengan rasio perubahan tebal otot diafragma. Terdapat korelasi negatif antara rasio perubahan pennation angle otot rektus femoris hari kedua hingga hari kelima dengan pennation angle otot rektus femoris hari pertama. Terdapat korelasi positif antara rasio perubahan pennation angle otot rektus femoris hari kedua hingga kelima dengan
pennation angle otot rektus femoris hari kedua hingga kelima. Terdapat korelasi negatif antara rasio perubahan tebal otot diafragma hari kedua hingga hari kelima dengan tebal otot diafragma hari pertama.
.....Background: Critical disease mortality rates decline worldwide, but survivors experience significant functional disability due to muscle destruction. Muscle weakness that occurs in ICU patients is referred to as ICU-AW. Assessment of diaphragm muscle thickness has been used to predict breathing effort and

ventilator use. Pennation angle is a pattern of muscle fibers in relation to muscular axis that functions as a muscle strength.
Purpose: Determine the changing ratio in pennation angle of the rectus femoris muscle which is associated with changing ratio of diaphragm muscle thickness.
Methods: 34 research subjects who were admitted to the Intensive Care Unit using mechanical ventilation, thickness of diaphragm muscle and pennation angle of the rectus femoris muscle were measured on the first day until the fifth day of treatment using ultrasonography. Then the changing ratio of diaphragm muscle thickness and the changing ratio of pennation angle of the rectus femoris muscle were calculated on the second to the fifth day then the correlation analysis were done.
Result: There was no correlation between the changing ratio of pennation angle of the rectus femoris muscle with the changing ratio of diaphragm muscle thickness on the second to the fifth day (R = 0.041 - 0.211, p = 0.231 - 0.816). There was a moderate to strong correlation between the changing ratio of pennation angle of the rectus femoris muscle on the second to the fifth day with pennation angle of the rectus femoris muscle on the first day (R = -0,615 to -0,777, p = 0.001). There was a moderate to strong correlation between the changing ratio of pennation angle of the rectus femoris muscle on the second to the fifth day with pennation angle of the rectus femoris muscle on the second to the fifth day (R = 0.471 - 0.728, p = 0.001 - 0.005). There was a moderate to strong correlation between the changing ratio of diaphragm muscle thickness of the second to the fifth day with the diaphragm muscle thickness on the first day (R = -0,538 to -0,710, p = 0.001).
Conclusion: There is no correlation between the changing ratio of pennation angle of the rectus femoris muscle with the changing ratio of diaphragm muscle thickness. There is a negative correlation between the changing ratio of pennation angle of the rectus femoris muscle on the second to the fifth day with the first day of pennation angle of the rectus femoris muscle. There is a positive correlation between the changing ratio of pennation angle of the rectus femoris muscle on the second to the fifth day with the rectus femoris muscle pennation angle on the second to the fifth day. There is a negative correlation between the diaphragm thickness changes on the second to the fifth day with the thickness of the diaphragm muscle on the first day.