

ABSTRACT

Background : Total protein is a plasma protein composed of albumin, globulins, and several other proteins present in smaller amounts. Pre-analytical errors can occur during sample collection, processing, storage, and transportation. These include factors such as the type and duration of tourniquet use before blood collection, which can influence errors in the pre-analytical phase. Applying a tourniquet for more than 1 minute during phlebotomy increases pressure on the blood vessel walls, allowing plasma and small molecules to pass through the capillary walls and into the surrounding tissue. This process is known as hemoconcentration. Hemoconcentration results in a relative increase in red blood cell count and higher molecular weight compounds in the collected sample.

Objective : Find out if there is a difference in total protein levels in venous blood damming for 1 minute and 3 minutes.

Research Methods : This study used pre-experimental research with Posttest Only Design, as many as 33 serum samples from venous blood dissection for 1 minute and 3 minutes which were then statistically tested using the Shapiro-Wilk normality test and then continued the Paired Sample T Test.

Research Results : Normality test with Shapiro-Wilk method showed that the data were normally distributed ($p = 0,346$) for venous blood damming for 1 minute and ($p = 0,676$) for venous blood damming for 3 minutes on albumin levels. Paired Sample T Test showed a difference in albumin levels for 1 minute and 3 minutes of damming with a value of ($p = 0,000$). The average albumin level increased by 0,4 g/dL with a percentage difference of 4,8%.

Conclusion : Examination of total protein levels during a 3-minute drip was higher than albumin levels during a 1-minute drip.

Keywords : Total protein, hemoconcentration, tourniquet application

ABSTRAK

Latar Belakang : Protein total merupakan suatu protein plasma yang tersusun atas albumin, globulin dan beberapa protein lain dalam jumlah yang lebih sedikit. Kesalahan pada tahap pra analitik dapat terjadi saat sampel dikumpulkan, diproses, disimpan dan diangkut. Termasuk jenis dan waktu penggunaan tourniquet sebelum pengambilan darah juga dipengaruhi oleh kesalahan pada tahap pra analitik. Pemasangan tourniquet yang melebihi 1 menit dalam proses flebotomi mengakibatkan peningkatan tekanan terhadap dinding pembuluh darah yang memungkinkan plasma dan molekul kecil mengalir melalui dinding kapiler dan masuk ke jaringan. Proses ini dikenal sebagai hemokonsentrasi, hemokonsentrasi menghasilkan peningkatan relatif dalam jumlah sel darah merah serta senyawa dengan berat molekul lebih tinggi dalam sampel yang diambil.

Tujuan Penelitian : Mengetahui perbedaan kadar protein total pada lama pembendungan *tourniquet* selama 1 menit dan 3 menit.

Metode Penelitian : Penelitian ini menggunakan jenis penelitian pra-eksperimental dengan desain *Posttest Only Design*, sebanyak 33 sampel serum dari pembendungan darah vena selama 1 menit dan 3 menit yang kemudian di uji secara statistik menggunakan uji normalitas *Shapiro-Wilk* lalu dilanjutkan uji *Paired Sample T Test*.

Hasil Penelitian : Uji normalitas dengan metode *Shapiro-Wilk* menunjukkan bahwa data berdistribusi normal ($p=0,346$) untuk pembendungan darah vena selama 1 menit dan ($p=0,676$) untuk pembendungan darah vena selama 3 menit terhadap kadar protein total. Uji *Paired Sample T Test* menunjukkan adanya perbedaan kadar protein total pembendungan 1 menit dan 3 menit dengan nilai ($p=0,000$). Rerata kadar protein total mengalami peningkatan sebesar 0,4 g/dL dengan presentase selisih sebesar 4,8%.

Kesimpulan : Pemeriksaan kadar protein total selama pembendungan 3 menit lebih tinggi daripada kadar protein total pembendungan selama 1 menit.

Kata Kunci : Protein total, hemokonsentrasi, pemasangan *tourniquet*