

## **ASSOCIATION BETWEEN HYDRATION STATUS AND NIHSS SCORE OF ACUTE ISCHEMIC STROKE PATIENT ON ADMISSION**

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### **Abstract**

Dehydration is one condition that often found in stroke patients. Dehydration reduces cerebral blood flow, extends infarct volume and may affects neurological deficits in acute ischemic stroke. Many parameters are used to assess dehydration however there is no gold standard. One of the parameter in assessing dehydration is BUN/creatinine ratio. BUN/creatinine ratio often used to assess dehydration because BUN and creatinine are routine laboratory examination for the evaluation of acute ischemic stroke patients. BUN/creatinine ratio  $\geq 15$  is used as cut off for dehydration. The association between dehydration measured with BUN/creatinine ratio and neurological deficits in acute ischemic stroke patients has not been widely studied. The purpose of this study is to determine the association between the BUN/creatinine ratio and neurological deficits in acute ischemic stroke measured with NIHSS score.

This study is a cross-sectional study, subjects are acute ischemic stroke patients admitted at Dr. Sardjito Hospital. Subjects who met the inclusion and exclusion criteria were examined for BUN and creatinine level and NIHSS score at the time of admission. Statistical analysis was used to determine the association between dehydration, demographic and laboratory variables and NIHSS scores.

There were total 48 subjects, 23 (47.9%) subjects were dehydrated and 25 (52.1%) subjects were in normal hydration status. The NIHSS score has a median value of 4 with a range of 1-29. On bivariate analysis, variables that associated significantly with high NIHSS score at the time of admission were dehydration (95% CI, 2.4-10.4;  $p = 0.001$ ) and infection (95% CI, 2.2-12.5 ;  $p = 0.021$ ). Age ( $r = 0.33$ ;  $p = 0.021$ ) and ASPECT score ( $r = -0.45$ ;  $p = 0.001$ ) also correlated significantly with the NIHSS score at admission. In the multivariate analysis, dehydration ( $B = -0.252$ ;  $p = 0.041$ ) and ASPECT score ( $B = -0.523$ ;  $p < 0.001$ ) were significantly associated with NIHSS score at admission.

This study concluded that poor hydration status was associated with higher NIHSS score in acute ischemic stroke patient on admission.

**Keywords:** dehydration, BUN/creatinine ratio, NIHSS, ischemic stroke

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## **HUBUNGAN ANTARA STATUS HIDRASI DENGAN SKOR NIHSS PASIEN STROKE ISKEMIK AKUT SAAT ADMISI**

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### **Abstrak**

Dehidrasi merupakan fenomena yang sering ditemui pada penderita stroke. Dehidrasi mengurangi aliran darah serebral dan memperluas volume infark sehingga turut mempengaruhi defisit neurologis pada stroke iskemik akut. Banyak parameter yang digunakan untuk menilai dehidrasi namun belum ada parameter yang ditetapkan sebagai baku emas. Salah satu parameter dalam menilai dehidrasi adalah rasio BUN/kreatinin. Rasio BUN/kreatinin  $\geq 15$  menggambarkan kondisi dehidrasi. Hubungan antara dehidrasi yang dinilai menggunakan rasio BUN/kreatinin dengan defisit neurologis pasien stroke iskemik akut belum banyak diteliti. Tujuan penelitian ini adalah mengetahui hubungan rasio BUN/kreatinin dengan defisit neurologis stroke iskemik akut yang dinilai menggunakan skor NIHSS.

Penelitian ini merupakan penelitian potong lintang, subjek penelitian adalah pasien stroke iskemik akut yang dirawat di RSUP Dr. Sardjito. Subjek yang memenuhi kriteria inklusi dan eksklusi dilakukan pemeriksaan BUN dan kreatinin serta penilaian skor NIHSS pada saat admisi. Analisis statistik digunakan untuk mengetahui hubungan antara dehidrasi, variabel demografi dan laboratorium dengan skor NIHSS yang dilanjutkan uji regresi linier.

Didapatkan 48 subjek dengan 23 (47,9%) subjek dehidrasi dan 25 (52,1%) subjek dalam status hidrasi normal. Skor NIHSS memiliki nilai median 4 dengan rentang 1-29. Pada uji bivariat, variabel yang berhubungan signifikan dengan skor NIHSS yang lebih tinggi pada saat admisi adalah dehidrasi (95% CI, 2,4-10,4;  $p = 0,001$ ) dan infeksi (95% CI, 2,2-12,5;  $p = 0,021$ ). Usia ( $r = 0,33$ ;  $p = 0,021$ ) dan skor ASPECT ( $r = -0,45$ ;  $p = 0,001$ ) juga berkorelasi signifikan dengan skor NIHSS saat admisi. Pada uji multivariat, skor ASPECT ( $B = -0,523$ ;  $p < 0,001$ ) dan dehidrasi ( $B = -0,252$ ;  $p = 0,041$ ) berhubungan signifikan dengan skor NIHSS saat admisi.

Kesimpulan penelitian adalah status hidrasi buruk berhubungan dengan skor NIHSS yang lebih tinggi saat admisi.

Kata kunci: dehidrasi, rasio BUN/kreatinin, NIHSS, stroke iskemik

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