Clinical Significance of Low-Triiodothyronine Syndrome in Patients Requiring Non-Surgical Intensive Care
— Triiodothyronine Is a Comprehensive Prognostic Marker for Critical Patients With Cardiovascular Disease —

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|                          | Euthyroid (n=2,425) | Hypothyroidism (n=262) | Hyperthyroidism (n=289) | P value |
|--------------------------|---------------------|------------------------|-------------------------|---------|
| **Age (years old)**     | 69 (61-78)          | 73 (66-81)             | 68 (59-77)              | <0.001  |
| **Gender (male, %)**    | 1,787 (73.7%)       | 167 (63.7%)            | 208 (72.0%)             | 0.003   |
| **Medical history**     |                     |                        |                         |         |
| Hypertension (yes, %)   | 1,716 (70.7%)       | 194 (74.0%)            | 186 (64.4%)             | 0.032   |
| Diabetes mellitus (yes, %) | 893 (36.8%)     | 102 (38.9%)            | 118 (40.8%)             | 0.357   |
| Dyslipidemia (yes, %)   | 1,278 (52.7%)       | 121 (46.2%)            | 145 (50.2%)             | 0.111   |
| **Vital signs and status** |                     |                        |                         |         |
| Systolic blood pressure (mmHg) | 140 (114-163) | 140 (98-174)          | 136 (112-156)           | 0.113   |
| Diastolic blood pressure (mmHg) | 80 (62-95)   | 75 (56-97)             | 76 (60-90)              | 0.018   |
| Pulse (beats/min)       | 85 (68-106)         | 89 (63-114)            | 90 (74-110)             | 0.036   |
| Respiratory Rate (beats/min) | 20 (16-28)    | 23 (17-30)             | 22 (16-28)              | 0.061   |
| Body Temperature (°C)   | 36.3 (35.8-36.8)    | 36.1 (35.4-36.6)       | 36.6 (36.1-37.2)        | <0.001  |
| Body Mass Index (%)     | 23.6 (21.3-26.2)    | 22.8 (20.3-25.4)       | 22.7 (20.8-25.2)        | 0.001   |
| LVEF (%)                | 52 (40-63)          | 45 (30-63)             | 51 (42-63)              | <0.001  |
| **Arterial blood gas**  |                     |                        |                         |         |
| pH                      | 7.41 (7.36-7.45)    | 7.35 (7.19-7.42)       | 7.42 (7.37-7.45)        | <0.001  |
| PCO₂ (mmHg)             | 37 (33-43)          | 39 (33-50)             | 37 (31-41)              | 0.001   |
| PO₂ (mmHg)              | 113 (81-164)        | 110 (79-191)           | 111 (82-150)            | 0.603   |
| HCO₃⁻ (mmol/l)          | 23.2 (20.3-25.4)    | 21.0 (16.3-23.9)       | 23.4 (20.4-26.2)        | <0.001  |
| SaO₂ (%)                | 98 (96-99)          | 98 (94-99)             | 98 (96-99)              | 0.001   |
| Lactate (mmol/l)        | 1.6 (1.1-2.7)       | 2.4 (1.3-5.3)          | 1.5 (1.0-2.6)           | <0.001  |
| **Laboratory data**     |                     |                        |                         |         |
| TSH (µIU/L)             | 1.59 (1.00-2.47)    | 7.09 (5.90-8.86)       | 0.34 (0.21-0.42)        | <0.001  |
| FT3 (µIU/L)             | 2.17 (1.76-2.55)    | 2.02 (1.63-2.50)       | 1.91 (1.50-2.45)        | <0.001  |
| FT4 (µIU/L)             | 1.02 (0.91-1.13)    | 0.90 (0.78-1.01)       | 1.01 (0.92-1.16)        | <0.001  |
| WBC (U/l)               | 9,210 (7,100-11,970)| 9,235 (7,003-12,073)  | 9,900 (7,600-13,690)    | 0.008   |
| Hemoglobin (g/dl)       | 13.3 (11.4-14.8)    | 12.4 (10.3-14.0)       | 12.8 (11.1-14.8)        | <0.001  |
| BUN (mg/dl)             | 18.6 (14.4-27.8)    | 23.7 (14.8-24.7)       | 19.3 (14.3-36.8)        | <0.001  |
| Creatinine (mg/dl)      | 0.94 (0.73-1.38)    | 1.17 (0.85-2.15)       | 0.85 (0.64-1.49)        | <0.001  |
| Sodium (mmol/L)         | 140 (138-142)       | 140 (137-142)          | 139 (137-142)           | 0.94    |
| Potassium (mmol/L)      | 4.1 (3.8-4.5)       | 4.3 (3.8-4.9)          | 4.1 (3.8-4.5)           | 0.001   |
| BG (mg/dl)              | 151 (119-218)       | 180 (139-280)          | 148 (119-204)           | <0.001  |
| CRP (mg/dl)             | 0.30 (0.09-1.77)    | 0.29 (0.10-1.40)       | 1.09 (0.17-8.21)        | <0.001  |
| BNP (pg/ml)             | 151 (35-584)        | 483 (114-1,249)        | 170 (49-543)            | <0.001  |
| **Nutritional status**  |                     |                        |                         |         |
| PNI                     | 46.0 (39.5-51.9)    | 44.6 (39.0-52.1)       | 41.7 (35.0-48.1)        | <0.001  |
| CONUT score             | 2 (1-4)             | 3 (1-5)                | 3 (1-6)                 | <0.001  |
| Albumin (g/dl)          | 3.7 (3.3-4.0)       | 3.5 (3.1-3.8)          | 3.6 (3.1-4.0)           | <0.001  |
| Lymphocyte count (/µl)  | 1,611 (1,004-2,424) | 1,688 (995-3,110)      | 1,119 (505-1,798)       | <0.001  |
| Total cholesterol (mg/dl) | 175 (144-204)   | 168 (139-202)          | 165 (129-201)           | 0.005   |
| **Scoring**             |                     |                        |                         |         |
| APACHE II (points)      | 10 (7-15)           | 15 (11-23)             | 11 (7-15)               | <0.001  |
| **Mechanical support (cases) during the ICU stay** |         |                        |                         |         |
| NPPV (yes, %)           | 567 (23.4%)         | 93 (35.5%)             | 54 (18.7%)              | <0.001  |
| ETI (yes, %)            | 401 (16.5%)         | 67 (25.6%)             | 64 (22.1%)              | <0.001  |
| Pacing (yes, %)         | 138 (5.7%)          | 19 (7.3%)              | 12 (4.2%)               | 0.291   |
| IABP (yes, %)           | 336 (13.9%)         | 39 (14.9%)             | 36 (12.5%)              | 0.703   |
| PCPS (yes, %)           | 97 (4.0%)           | 23 (8.8%)              | 9 (3.1%)                | 0.001   |
| CHDF (yes, %)           | 302 (12.5%)         | 57 (21.8%)             | 51 (17.6%)              | <0.001  |

LVEF, left ventricular ejection fraction measured on echocardiography; WBC, white blood cell; BUN, blood urea nitrogen; BG, blood glucose; CRP, C-reactive protein; BNP, brain natriuretic peptide; PNI, prognostic nutritional index; CONUT, controlling nutritional status; APACHE II, Acute Physiology and Chronic Health Evaluation II; NPPV, noninvasive positive pressure ventilation; ETI, endotracheal intubation; IABP, intra-aortic balloon pumping; PCPS, percutaneous cardiopulmonary support; CHDF, continuous hemodiafiltration; ICU, intensive-care unit.

The P values between four groups were determined using the Kruskal-Wallis test or the bivariate test.