Evaluation of the Source and Count of Urinary Erythrocytes in Healthy Individuals Using an Automated Urinary Flowcytometer

Dear Sir,

A newly developed automated urinary flowcytometer (a prototype of UF-100, TOA Medical Electronics, Kobe, Japan) by us allows a clear discrimination of erythrocytes from other solid components of urine. According to our evaluation, the source and count of erythrocytes in urine could be determined in about 60 s. In this study, the normal range of the urinary erythrocyte count and the source of urinary erythrocytes in healthy individuals were investigated using this analyzer. For the diagnosis of the source of the urinary erythrocytes, the criteria of Kitasato University Kidney Center for this analyzer were applied [1]. Urine containing erythrocytes was regarded as nonglomerular type when 80% or more erythrocytes were distributed in a forward scatter (FSC) intensity range of 84 or above, as glomerular type when 80% or more erythrocytes were distributed in an FSC intensity range of 126 or less and as mixed type when neither erythrocytes in the FSC intensity range of 126 or less nor those in the FSC intensity range of 84 or above occupied 80% or more of all erythrocytes. The urine type was regarded as nonglomerular when both erythrocytes with the FSC intensity of 126 or less and those with the FSC intensity of 84 or above occupied 80% or more of all erythrocytes. The subjects were 133 regularly employed volunteers (age range, 20-48 years; mean age, 30.5 years) who noted no urinary tract symptoms and showed normal blood pressure, consisting of 41 females not in their menstrual period (age range, 20-39 years; mean age, 24.8 years) and 92 males (age range, 20-48 years; mean age, 33.1 years). The blood pressure was measured once at collection of urine samples, and those in whom the systolic blood pressure was 150 mm Hg or above or the diastolic blood pressure was 90 mm Hg or above were excluded. Intermediate urine was collected from these subjects using urine sampling cups, immediately transferred to 50-ml sterilized Spitz tubes and analyzed within 30 min using the automated urinary flowcytometer. Before analysis, the Spitz tubes were shaken by 10 strokes to make the contents homogeneous.
Urinary erythrocytes were derived from glomeruli in all samples of healthy subjects. The urinary erythrocyte count had an exponential-logarithmic distribution. Values 97.5% of the urinary erythrocyte count in healthy individuals or higher were regarded as abnormal, and hematuria was considered to be positive when 11.0/µl or more erythrocytes were observed by this analyzer. Its findings corresponded to those of the report of Birch et al. [2].

References

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