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Letter to Editor

Circulating CD62P small microparticles levels are increased in hypertension

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Abstract: The study aims to find a new biomarker in hypertension. Our study is the first time to demonstrate that the CD62P small microparticle (diameter is <0.5 um) was a new microparticle population and a new biomarker in hypertension.

Keywords: Small microparticle, hypertension

Microparticles (MPs) are derived from various cells as response to apoptosis or activation, with a size <1 um [1]. MPs are not only biomarkers but also have biological functions [2] for this reason, MPs plays an important role in cardiovascular diseases, furthermore, numerous papers study MPs in cardiovascular diseases, including hypertension, coronary artery diseases. Due to technical limitation of conventional flow cytometry, most of studies detect microparticles ≥0.5 um, however, there is an evidence showing 80% MPs <0.5 um [1], termed small microparticles (SMPs). Therefore, the data of small microparticle is lacking. Our aim was to study SMPs in hypertension to find a new biomarker.

16 healthy people and 17 hypertension patients were recruited. The hypertension was diagnosed as systolic/diastolic blood pressure higher than or equal to 140/90 mmHg. Patients with a history of chronic renal failure requiring dialysis, hepatic or hematologic disorders, or inflammation, autoimmune, or malignant diseases were excluded. Healthy subjects were included if they had no known history of medical illness, normal blood pressure (<140/90 mmHg), and appeared healthy in a physical examination. The ethic committee approved this consent procedure. Verbal informed consents were obtained from every experimental subject. CD62P platelet SMPs were detected by flow cytometry (Accuri C6, Accuri Cytometers). For flow cytometry analysis of SMPs, as shown in **Figure 1** with representative plots. a signal intensity threshold of 35,000 was used and standard beads (0.46 μm diameter; Sigma, St. Louis, MO) were used for calibration. An isotype control antibody was used as the negative control. SMPs was defined as CD62P positive and size ≤0.46 um. The result and clinical parameters were shown in **Table 1**.

According to SPSS17.0, the result showed that the number of CD62PSMPs in hypertension patients was significantly higher than healthy control (P = 0.015).

To our best knowledge, this is the first study to investigate CD62P SMPs in hypertension, our findings are consistent with previous data CD62P MPs is higher in hypertension, the difference is Preston RA et al. study [3] focus on the size of CD62P MPs <1.5 μm, as we known, conventional flow cytometery detects the size of MPs ≥0.5 μm, to be precise, the Preston A et al. study focus on the size of CD62P MPs >0.5 μm, however, our study focus on the size of CD62P SMPs ≤0.46 μm, we studied a new population of CD62P SMPs increased in hypertension patients.

CD62P is mainly derived from platelet as response to cell activation, it is regarded as a risk factor for vascular disease, studies show that CD62P is involved in inflammation and

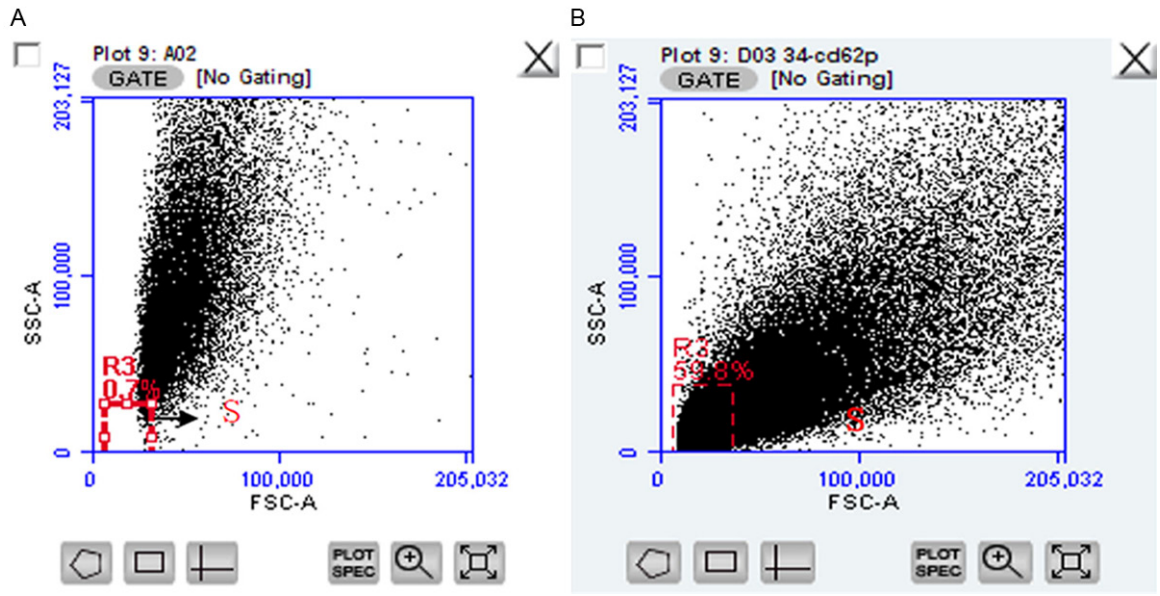

Figure 1. Representive flow cytometric data of circulating SMPs. A. Side scatter intensity versus forward scatter intensity dot plot derived from a sample containing standard beads (0.46 μm diameter). B. Side scatter intensity versus forward scatter intensity dot plot derived from a blood sample containing SMPs, which were defined as those with a diameter of ≤0.46 μm. S window was a gate of MP size.

Table 1. Data of patients and healthy control

Characteristics	Healthy Control	Hypertension
Age (y)	33.69 ± 9.35	68.00 ± 12.26
Gender (female/male)	8/8	9/8
CD62P SMPs (counts/μl)	2.10 (1.45-3.41)	3.48 (2.47-6.78)

SMP: small microparticle.

thrombosis [4], which increase the risk of atherosclerosis. Preston RA et al. study shows CD62P MPs is related to systolic blood pressure and diastolic blood pressure. Our experiment further support that platelet activation may play a role in hypertension-induced vascular injury to increase the risk of atherosclerosis. Although, the mean age of healthy control was younger than hypertension patients, from some papers study show MPs is not siginificantly related to age [3, 5].

In conclusion, our experiment found a new CD62P small microparticle population in hypertension, our result showed CD62PSMPs was a new biomarker in hypertension.

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Disclosure of conflict of interest

None.

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