1. **No.**

   FP01912093

2. **Title**

   Unraveling of the Relationship of α7 Nicotinic Receptor in Macrophages to Metabolic Syndrome

3. **Period**

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4. **Summary**

   [Background] Monocytes/macrophages play important roles in adipose tissues inflammation and can be polarized as inflammatory M1 or anti-inflammatory M2. Although nicotinic α-7 acetylcholine receptor (α7nAChR), which is expressed in monocyte/macrophages, is a critical regulator of anti-inflammatory actions, the relationship between cigarette smoking and monocyte polarity has not been extensively explored. [Methods] Peripheral blood mononuclear cells (PBMCs) were isolated from between smoking and non-smoking patients with metabolic syndrome or diabetes mellitus, and we then investigated the number of M1 (CD68+CCR2+) or M2 (CX3CR1+CD163+) by flow cytometry analysis. In animal study, expression of α7nAChR and inflammatory markers of monocyte were evaluated in the diabetic state. Additinally, myocardial fibrosis was investigated using Picrosirius Red staining in the diabetic heart.

   [Results] M2 monocyte reduced in smoking donor without metabolic syndrome or diabetes mellitus, while M1 monocyte did not differ between smoking and non-smoking without metabolic syndrome or diabetes mellitus. We found no alterations in monocyte polarity (M1, M2) between smoking and non-smoking patients with metabolic syndrome or diabetes mellitus. In animal study, α7nAChR expression was decreased in monocyte of db/db mice, and inflammatory markers was increased. Additionally, Picrosirius Red staining showed an increase of fibrosis in the myocardium of diabetic mice.

   [Conclusions] We showed that diabetic state may reduce α7nAChR expression of monocyte, which leads to inflammation and myocardial fibrosis.