

## 4-①-1.

**Increased plasma levels of myosin heavy chain 11 is associated with atherosclerosis**

(社会人大学院博士課程2年東京医科大学病院 循環器内科、東京医科大学 細胞生理学)

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Extensive studies have revealed numerous potential biomarkers for atherosclerosis, but tissue-specific biomarkers are still needed. Recent lineage-tracing studies revealed that smooth muscle cells (SMCs) contribute substantially to plaque formation and the loss of SMCs causes plaque vulnerability. We investigated the association of SMC-specific myosin heavy chain 11 (myosin-11) with atherosclerosis. Forty-six patients with atherosclerosis and 34 control subjects were recruited. In the atherosclerosis cohort, 35 patients had either coronary artery disease (CAD) or peripheral artery disease (PAD), and 11 had both CAD and PAD. Circulating myosin-11 levels were higher in the CAD or PAD group than in control subjects. The area under the receiver operating characteristic curve of myosin-11 was 0.954 with a specificity of 88% at a sensitivity of 90%, which was significantly higher than that of high-sensitivity C-reactive protein (hsCRP). Circulating myosin-11 levels in the CAD and PAD group were higher than in the CAD or PAD group, while hsCRP

concentrations did not differ between these groups. Multinomial logistic regression analyses showed a significant association of myosin-11 levels not only with the presence of atherosclerosis, but also with the presence of multiple atherosclerotic regions. Circulating levels of myosin-11 may be useful for detecting spatial expansion of atherosclerotic regions.

## 4-①-2.

**Changes in hemodynamics and lower limb conditions during 3-hour persistent sitting**

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[Background] Sedentary behavior is associated with a number of adverse health conditions, such as diabetes, obesity, cardiovascular diseases and cancer incidence. However, physical changes due to sitting even in a short period remain unknown.

[Methods] Eleven healthy males (age;  $29.8 \pm 9.6$  years old, body weight;  $64.5 \pm 4.1$  kg, BMI;  $22.3 \pm 2.6$  kg/m<sup>2</sup>) completed a 3-hour persistent sitting. All the data was compared between before and after the 3-hour continuous sitting. The evaluated parameters were; physical fatigue (questionnaire), edema (circumferences in the calf/ankle, extracellular water/total body water (ECW/TBW) ratio), muscle oxygenation levels (near-infrared time-resolved spectroscopy), and hemodynamics in lower limbs (ultrasonography).

[Results] After persistent sitting, physical fatigue in the lower limb was augmented ( $p < 0.05$ ). Circumferences in the bilateral calf/ankle were significantly enlarged, and ECW/TBW ratio in the lower limbs was increased due to the 3-hour constant sitting ( $p < 0.05$ , respectively). Oxygenated-Hb and total-Hb in the lateral head of gastrocnemius muscles were decreased ( $p < 0.05$ ). Interestingly, volume flow and velocity in

the lower limb was decreased ( $p < 0.05$ ).

[Conclusions] The results demonstrate that the 3-hour uninterrupted sitting elicits negative consequences including augmented physical fatigue level, edema and reduced muscle oxygenation in the lower limb. Additionally, the 3-hour persistent sitting impacts on hemodynamics resulting in decreasing volume flow and velocity of the artery in lower limb.

#### 4-①-3.

### 心筋梗塞急性期の安静2核種<sup>99m</sup>Tc-sestamibi/<sup>123I</sup>-BMIPP同時収集SPECTによる慢性期心筋生存性の予測

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【背景】 近年、Cadmium-zinc-telluride (CZT) カメラシステムの臨床使用が可能となり、被ばくを低減できる安静2核種<sup>99m</sup>Tc-sestamibi/<sup>123I</sup>-BMIPP同時収集SPECT (dual SPECT) が日常診療で行われている。しかしdual SPECTによる急性心筋梗塞領域の<sup>99m</sup>Tc-sestamibiと<sup>123I</sup>-BMIPPの各々の% uptakeから慢性期の心筋生存性を予測する閾値の報告は少ない。

【目的】 本研究の目的は急性心筋梗塞患者の急性期梗塞領域の<sup>99m</sup>Tc-sestamibiと<sup>123I</sup>-BMIPPの各々の% uptakeから慢性期の心筋生存性を予測する至適閾値を決定することである。

【方法】 対象は急性心筋梗塞にて経皮的冠動脈形成術を行い、平均8±6日後にdual SPECTを施行し、慢性期(11±2ヶ月)に負荷Tc製剤心筋SPECTを施行した患者30例。急性期のdual SPECTおよび慢性期安静時SPECTからQPSを用いて17セグメントモデルの% uptakeを求めた。慢性期の<sup>99m</sup>Tc製剤の% uptake 50%以上を心筋生存性ありとし、急性期dual SPECTの% uptakeから慢性期の心筋生存性を予測する閾値を左前下行枝(LAD)領域および非左前下行枝(non-LAD)領域別に、ROC曲線を用いて求めた。

【結果】 慢性期の% uptake 50%以上を予測する閾値は、LAD領域では<sup>99m</sup>Tc-sestamibiは% uptake

47%、<sup>123I</sup>-BMIPPは% uptake 31%、一方non-LAD領域では<sup>99m</sup>Tc-sestamibiは% uptake 52%、<sup>123I</sup>-BMIPPは% uptake 48%であった。慢性期の% uptake 50%以上の予測における感度、特異度、正診率およびAUC値は、LAD領域では<sup>99m</sup>Tc-sestamibiは92%、92%、92%、0.94、<sup>123I</sup>-BMIPPは90%、85%、89%、0.92、またnon-LAD領域では<sup>99m</sup>Tc-sestamibiは81%、93%、85%、0.92、<sup>123I</sup>-BMIPPは81%、90%、84%、0.92であった。

【結語】 CZTカメラによる心筋梗塞急性期dual SPECTは<sup>99m</sup>Tc-sestamibiだけでなく<sup>123I</sup>-BMIPPからも慢性期の心筋生存性を予測できるが、LAD領域とnon-LAD領域で閾値が異なることが示唆された。

#### 4-①-4.

### Titanium implant due to peri-implantitis of Elucidation of the relationship between corrosion and dissolution behavior and fluorine

(社会人大学院博士課程5年歯科口腔外科・矯正歯科)

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Background : Recently, some studies have been reported that fluoride was suggested to increase the risk of periimplantitis. However, no studies have examined this phenomenon in human and a large animal model. Therefore, the purpose of this study was to investigate the effects on surrounding tissues by implanting dental implants in beagle dogs and causing peri-implantitis. Furthermore, we investigated to clarify the relationship between peri-implantitis by quantitatively examining the corrosion of titanium and its dissolution by fluorine.

Methods : Bilateral mandibular posterior molars were extracted from 3 beagle adult dogs (12-15 kg, male), and a healing period of 6 months was followed to create a healing model for extracted tooth sockets. Next, two dental implants were placed on each side of the mandible, for a total of 12 implants. They were classified into three groups ; 1. without fluorine and ligature, 2. with