

the present paper  $^{99m}\text{Tc}$  labeled albumin was injected rapidly into femoral artery. The changes of  $^{99m}\text{Tc}$  activity in the foot were recorded by scintillation counter. The mean transit time (MMT, sec.) of the dilution curve through the capillary bed of toes was obtained by mean of curve fitting with the analog computer.

Significant inverse relation was found between MBF and MTT ( $r = -0.79$ ,  $p < 0.01$ ), suggesting the adequacy of MBF determined by the present study.

MBF in toes average  $11.0 \pm 7.9$  ml/100g/min. in all diabetic patients and were significantly lower than those of normal subjects, averaging  $22.1 \pm 5.4$  ml/100g/min. ( $p < 0.05$ ). Moreover, all the patients with complication had diminished MBF in toes, and MBF was reduced in about half of the patients without complication. Thus, MBF in toes was useful indicator of the disturbance of peripheral blood flow of legs in patients with diabetes mellitus.

### **Application of Random Walk Equation for Flow Model**

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An attempt to applicate the Random Walk Equation for radioisotope dilution process through the system composing vascular net has been made. This equation is characterized by two parameters, mean transit time (MTT) and randomizing constant (K). The latter is thought to represent the anatomical arrangement of vascular space. Upon examining the input output curves monitored over heart and head, the K of cerebral vascular bed was appeared to be irrespective with the changes of cardiac output (CO),

while MTT was liable to increase with the increase of CO. The recorded curve was fitted to choose the optimal parameters iteratively using least square method.

An attempt to fit monitored curve without the information of input curve was done by using so called simplex method where arbitrary combination of four parameters should have been choosed if a boundary condition was set. This method might merit to analyze usual external monitoring curve over various organs in future.