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ORIGINAL TITLE	A Lymphoscintigraphic study of the pattern of lymphatic flow in patients with lower limb lymphoedema in Kandy Sri Lanka
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ABSTRACT	Increasing numbers of patients with unilateral or bilateral below or above knee lymphoedema with no apparent secondary cause have sought medical help in Kandy, Sri Lanka. Radionuclide Lymphoscintigraphy has emerged in recent years as the standard procedure for the visualization of the lymphatic system in patients with peripheral lymphoedema. Scintigraphic studies using radionuclides to examine the status of the lymphatic system of lower limbs in patients who suffer from lymphoedema in Sri Lanka using an available radiopharmaceutical have not been published. This study explains reasons for different levels of clinical lymphoedema found with each location of lymphoscintigraphic obstruction and compensatory mechanisms responsible for these differences based on lymphoscintigraphic findings. It also documents the prevalence and possible aetiology of lower limb lymphoedema in this group of patients. This study was done on eighty consecutive patients with lymphoedema of lower limbs with no apparent secondary cause, referred from Vascular Clinic of Teaching Hospital, Peradeniya. To asses the main compensatory mechanisms that control the extent of lymphoedema in these patients, the hypothesis of possible lymphovenous shunting was explored by studying the percentage and rate of liver uptake on scintigraphy. Lymphoscintigraphy was performed by injecting 148 MBq. of 99mTc Sulfur Colloid according to a standard protocol using a Gamma camera with a dedicated computer system. Visual assessments of appearance of lymph vessels, nodes and tracer in the liver in each category over time intervals were carried out. The liver uptake percentages were recorded and quantified using a standard formula. To evaluate the compensatory mechanisms taking place to control the progression of lymphoedema at different levels of blocks, possible evidence for collateral flows and Iymphovenous shunting was studied. Based on the demographic structure of this group of patients, it is apparent that lymphoedema in lower extremities were common in young females in 21 - 40 years age group with female dominance (F: M = 30:9) and a family predisposition. A

female dominance was found in all levels of lymphoscintigraphic obstruction. These findings would strongly suggest the presence of primary lymphoedema in this group. Non visualization of lymphatics proximally but visualization of lymph nodes more distally suggests distal hypoplasia. Therefore I would suggest that the evidence of obstruction in the medial lymphatics in patients is due to primary lymphoedema in this group and may be an appearance caused by hypoplastic lymphatics or hypoplastic and fibrotic nodes often visualized in this group of lymph nodes. This hypoplastic and fibrotic nodal obstruction was considered the main cause for lymphatic obstruction. Other possibilities included stenosis of the lymphatics or lymph nodal channels consequent to peri lymphangitis or lymphadenitis caused by secondary sepsis. It may be speculated in the clay soil, the aluminum and silica may playa role in the fibrotic process in this country as well and needs to be further studied. Percentage liver uptake in each of the clinical presentation of lymphoedema revealed a distinct pattern. Patients with unilateral below knee lymphoedema with popliteal nodal block, blocks in the lymphatics on the medial, side of the knee and lower vertical set of inguinal nodes showed a different pattern. These groups had significantly higher liver uptake values than even the control groups (p = 0.00 I, 0.0002 and 0.000 I), suggestive of lymphovenous or Iymphnodovenous shuntingThis could possibly account for the lower level of clinical lymphoedema in those with blocks in the inguinal nodes. Since the collateral flow was observed, this would suggest the presence of collateral circulation to minimize the extent of lymphoedema. The fact that increased liver uptake were seen in 'patients with unilateral lymphoedema presenting with lymphatic blocks in the popliteal, medial side of the knee and lower vertical set of the inguinal nodes when compared to control normal limbs clearly suggest early diversion of tracer through into the systemic circulation. This is a strong argument to suggest the presence of lymphovenous shunts or Iymphnodovenous shunts. It also suggests that such shunting may be responsible for the varying levels of lymphoedema in these patients.