

Letter to the Editor

Hypothesizing association between cancer cachexia and Fluorodeoxyglucose-positron emission tomography documented brown adipose tissue hypermetabolism in cancer patients with an illustration in grossly emaciated cachectic patient in hot Indian summer climate: Will beta blockers find use in the management of this condition?

Sir,
Enhanced metabolism has been suggested to play an

important role in the pathogenesis of cancer-induced cachexia in patients with advanced cancer. There has been some evidence of high prevalence of brown adipose tissue (BAT) in this group of patients obtained on the necropsy samples of peri-adrenal tissues compared to the normal controls.^[1] It would be logical to hypothesize that the observation of BAT hypermetabolism on fluorodeoxyglucose-Positron emission tomography (FDG-PET) studies in a fraction of cancer patients could

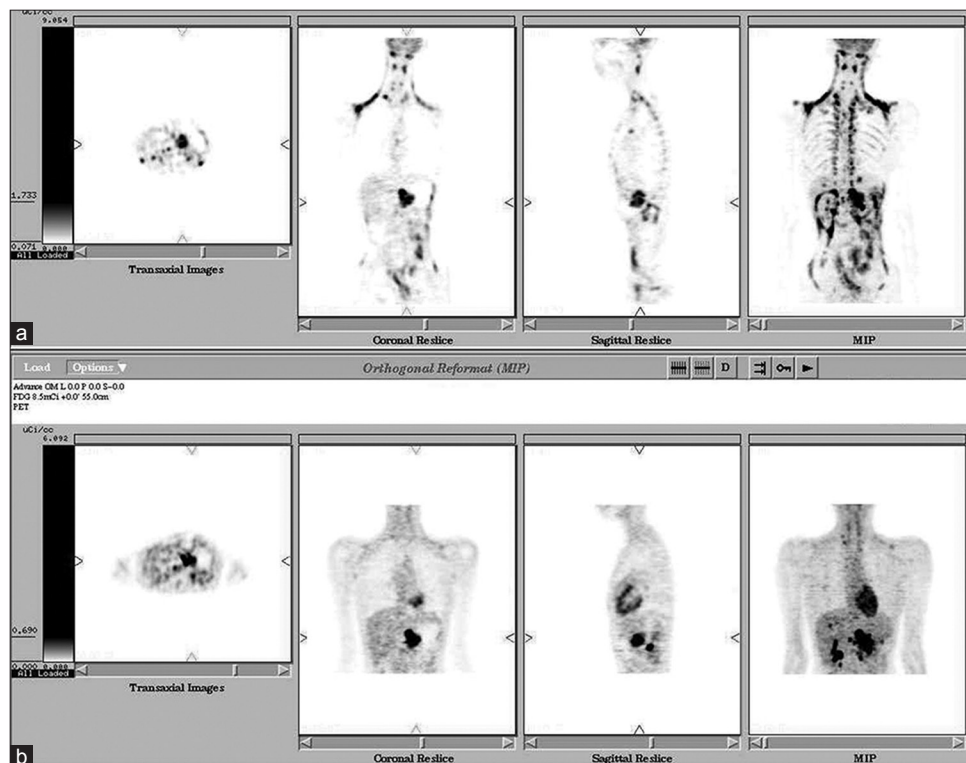


Figure 1: (a) Upper row: Whole body FDG-PET acquired 60 min after intravenous injection of FDG demonstrating intense and extensive FDG uptake in the brown adipose tissue in the supraclavicular and paravertebral regions bilaterally in addition to uptake in the neoplasm. (b) Lower row: Repeat FDG-PET following propranolol intervention on a different day demonstrates there was no FDG uptake in the BAT, though the uptake in the neoplasm persists

also be related to cancer cachexia and at least partly responsible for its causation.^[2] The FDG hypermetabolism in BAT demonstrated on PET studies has been traditionally described to be related to exposure to cold environment.^[3] However, this factor is not compulsorily noted in routine practice of PET and interestingly, in our experience, can be observed in cachectic patients in advanced cancer. In the present communication, such an example has been cited where extensive and intense brown adipose tissue hyperactivity is demonstrated in a 20-year-old grossly emaciated cachectic female patient of recurrent pheochromocytoma observed in hot Indian summer climate [Figure 1a, upper panel]. Her weight was 32 kg and body mass index 11.9. The sympathetic activation is postulated to be one of the prime reasons for brown adipose tissue stimulation in functionally active catecholamine secreting tumors which in turn could lead into a hypermetabolic state and cachexia in patients of pheochromocytoma.^[4]

It is likely that there exists an inter-relation between catecholamine hypersecretion, BAT activation (observed in a significant fraction of patients with catecholamine secreting tumors) and development of cachexia in this group of patients. The present case could be considered as a prototype of this etiopathogenesis and require to be observed prospectively. On a different day to a repeat study, the BAT hypermetabolism was abolished with priming of oral propranolol of 40 mg [Figure 1b lower panel], a pharmacological intervention proposed to be highly effective in reducing BAT activity.^[5] The observation that this intervention is effective for this condition suggests

that it could be translated potentially for treating this condition.

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10.4103/0019-509X.175828