peak prevalence was observed in the age group from 41 to 50 years.

In the second series, BMI did not differ between ST cases and the remaining without ST patient population (mean±SEM, unpaired t-test, n=204, 27.7±0.35 and n=583, 29.4±3.03), contrary to "classic" opinions [1].

In ST cases a positive history of diabetes was reported from 7.8% (16/204) vs. 9.1% (53/583) from the remaining non-ST population. The lack of difference as regards diabetes mellitus frequency (chi-square) opposes a previously held opinion [4] and reinforces another report that has not confirmed this association [5].

The problem seems that is often overlooked, since perceived disease duration differed significantly between ST cases and the remaining skin diseases [mean±SEM; unpaired t-test, n=202, 5.8±0.35 years (range 1 month-30 years) vs. n=580, 4.06±0.26 years (range 0.0 month-65 years), p=0.0004]. Moreover, skin tags as presenting complaint accounted for 24.0% of ST diagnoses (n=49/204). Lesions were localized on the neck (43.1%), multiple sites (21.5%), other intertriginous area (axilla and groin 15.2%), eyelids (10.1%) and trunk (8.8%).

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Imatinib-induced anasarca without heart failure: capillary leakage?

Dear Editor,

Imatinib mesylate, a selective tyrosine kinase receptor inhibitor of KIT and platelet derived growth factor receptor α (PDGFRα), is currently licensed for the treatment of chronic myelogenous leukemia (CML) and unresectable or metastatic gastrointestinal stromal tumors (GISTs), which are KIT-positive [1]. Treatment with imatinib is generally well tolerated with a low incidence of severe side edema, muscle cramps, diarrhea, nausea, skin rashes, and myelosuppression. Superficial edema and fluid retention occurs in nearly 10% of the patients on imatinib monotherapy but the anasarca type edema was not reported until today [2]. This letter presents a case of anasarca type edema without heart failure with imatinib treatment.

A 69-year-old man presented with nausea and right upper quadrant pain. On physical examination the patient was asthenic and had hepatomegaly. Laboratory evaluation revealed mild anemia with mild hypoalbuminemia. Abdominal computed tomography revealed multiple metastatic lesions in the liver and a 158×145×90 mm mass extending from the subhepatic area to the pelvis. A tru-cut biopsy of the mass showed KIT-positive GIST. The cardiac function was normal. The patient was put on imatinib 400 mg/day for metastatic GIST. After the 15th day of imatinib monotherapy the patient was readmitted with superficial leg edema. The laboratory evaluation showed mild anemia with normal renal and thyroid functions. He was treated with salt restriction and furosemide 40 mg twice a day. One week later the patient was readmitted with minimal improvement although imatinib dose had been reduced to 300 mg/day. After the 35th day of treatment the patient was readmitted again with anasarca type edema without heart failure. Imatinib was stopped. Doppler ultrasonography of the lower extremities and the pelvic region revealed massive subcutaneous edema without pressure of iliac veins. The patient was treated with salt restriction and intensive diuretic treatment with 80 mg/day i.v. furosemide. After the 14th day of intensive treatment with diuretics and salt restriction the anasarca type edema disappeared and the patient was doing well. Imatinib was readministered at 400 mg per day. After 15 days of imatinib treatment the patient was readmitted again with anasarca type edema. The drug was stopped and intensive diuretic treatment was repeated. After one week of intensive diuretic treatment the anasarca type edema was resolved and then sunitinib 50 mg/day was started. The patient is still on follow-up without any complication.

Edema and fluid retention are characteristic side effects of imatinib. The edema is usually mild, localized at the periorbital region or legs and may respond to diuretics. The periorbital edema is the most common site occurring in 47-70% of patients taking imatinib [3,4]. Very severe periorbital edema, cerebral edema and intramuscular edema was also reported with imatinib [5]. Anasarca type edema has not been reported so far. The mechanism of fluid retention and edema remains largely unknown. One possible mechanism is that imatinib-derived inhibition of PDGFRα on dermal dendrocytes may cause interstitial edema. In rats, the regulation of interstitial pressure between cells in the connective tissue is disturbed. As a result of increase of the interstitial fluid pressure in patients may similarly result in increased capillary permeability and fluid extravasation. Localized edema may not be explained by this hypothesis, but this theory may explain the cause of anasarca type edema. The optimal treatment of localized and anasarca type edema is still not known. As in all cases of edema, other causes should be carefully considered. Because of the risk of relapse, it is currently recommended that imatinib therapy be continued indefinitely in patients with CML and metastatic GIST. Repeated edema should be kept in mind with imatinib treatment.

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