The importance of previous CT scans in the diagnosis of invasive pulmonary aspergillosis

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A recent paper has drawn attention to the fact that the halo sign is not specific for invasive aspergillosis [Maschmeyer *et al.* 2009]. The authors also state that antifungal therapy is usually started in high-risk patients with fever and suggestive computerized tomography (CT) abnormalities. In a recent study, preemptive antifungal therapy triggered by CT abnormalities in allogeneic stem cell transplant recipients was shown to be feasible, even when broad spectrum antifungal prophylaxis is used [Dignan *et al.* 2009]. This is particularly important in the era of posaconazole, a broad spectrum azole that has been proved to reduce mortality in patients with acute myeloid leukaemia or high-risk myelodysplasia undergoing induction chemotherapy [Cornely *et al.* 2007]. The CT-based preemptive strategy reduced the use of parenteral antifungal agents by 68% [Dignan *et al.* 2009].

Owing to concerns of reduced sensitivity of galactomannan testing in patients receiving broad-spectrum antifungal prophylaxis, antifungal therapy in this study was triggered by symptoms and CT abnormalities [Dignan *et al.* 2009]. The evolution of CT findings in patients with invasive pulmonary aspergillosis is well characterized [Caillot *et al.* 2010]. The halo sign, which is a mass-like infiltrate surrounded by ground-glass opacity, is an early sign. However, the halo sign is indeed not pathognomonic for aspergillosis [Greene *et al.* 2007], and this is the pitfall in this approach.

We recently treated a 66-year-old patient with high-risk myelodysplasia with an induction course of daunorubicin and cytarabine. She received antifungal prophylaxis with posaconazole. Chest X-ray before therapy was normal. On day 5 she developed fever, refractory to

broad-spectrum antibiotics. On day 9 CT of the chest showed several halo signs in the right and left lung, very suggestive of invasive aspergillosis (Figure 1). She remembered that a CT of the chest had been performed 2 years before in another hospital during the investigation of a breast lesion (which was benign). The CT scans were compared and found to be identical. We judged the lesions not to be active but merely the consequences of pulmonary damage in the past. Posaconazole was continued and no other antifungal was started. The infection focus turned out to be the intravascular catheter. She recovered from neutropenia without fungal infections.

This case illustrates that with the CT-based strategy of preemptive therapy, some patients may be treated despite the absence of new pulmonary lesions. In many cases, this means that broad-spectrum antifungal prophylaxis will be replaced by possibly narrower spectrum therapy directed at *Aspergillus*. Most patients are screened with chest X-ray before starting chemotherapy, but the sensitivity of X-ray for detecting aspergillosis-like lesions is low.

We strongly encourage physicians to at least ask for previous pulmonary images. Possibly, baseline CT obtained before treatment could reduce the unnecessary use of antifungals. It may optimize exposure to evidence-based prophylaxis with posaconazole. Checking the 'criminal record' of previous chest CT scans may make decisions regarding antifungal therapy easier.

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Figure 1. Nodular lesion surrounded by ground-glass opacity (halo sign) in the right lung.

Conflict of interest statement

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