In the Literature

The Radiographic Course of Invasive Pulmonary Aspergillosis


Brodoefel and colleagues examined 310 serial high-resolution chest CTs from 40 consecutive immunocompromised patients with pulmonary aspergillosis to define the radiographic evolution of their disease. In 25% of patients, the initial CT demonstrated nodules <1 cm in size, whereas nodules were 1–3 cm in size in 31.5% of patients and >3 cm in 45% of patients; >1 area of consolidation was present in 15% of patients, and 17.5% had both nodules and sites of consolidation. A halo sign was initially present in 87.5% of patients, and this finding persisted for a median of 5 days (range, 1–30 days), whereas, as the halo sign resolved, a crescent sign evolved in 5% of patients on day 1, whereas nodules were 1–3 cm in size in 27.5% of patients and >3 cm in 45% of patients; >1 area of consolidation was present in 15% of patients, and 17.5% had both nodules and sites of consolidation. A halo sign was initially present in 87.5% of patients, and this finding persisted for a median of 5 days (range, 1–30 days), whereas, as the halo sign resolved, a crescent sign evolved in 5% of patients on day 1.

On day 1, the median size of the largest lesion was 3.1 cm², and the median number of lesions was 4 (range, 1–20). Most lesions (95%) initially increased in size, irrespective of the intensity of antifungal chemotherapy, peaking at a median maximum size of 12.5 cm² on day 9. The number of lesions also increased, albeit modestly, to a peak of 5.2 lesions on the same day, after which the number of lesions began to decrease. In contrast, lesion size plateaued for a median of 3.5 days before decreasing, such that 62.5% of patients had a 50% reduction in maximum size at 31 days. Complete resolution was observed in 42.5% of patients after a median of 80 days, with cavitary lesions taking longer to resolve than noncavitary lesions, although the presence of cavitation was ultimately associated with a greater likelihood of complete resolution. Overall, the outcome was not affected by either the initial size or the number of lesions.

This study provides a useful benchmark for the clinician dealing with immunocompromised patients with invasive pulmonary aspergillosis. Importantly, an increase in lesion size and, to a lesser extent, lesion number can be expected in the initial days after diagnosis, regardless of the therapy administered. A decrease in lesion size after a maximum size is reached can be expected after a delay of several days. The subsequent velocity of radiographic improvement is variable and, to some extent, depends on whether cavitation occurs, in which case total resolution is delayed. Cavitation is, nonetheless, a favorable indicator of the likelihood of complete radiographic resolution.

Four Hours to Start Treatment of Pneumonia?


The Joint Commission for the Accreditation of Healthcare and Centers for Medicare and Medicaid Services Set Measure PN-5b (JCAHO-CMS PN-5b) specifies that patients admitted to the hospital with an initial diagnosis of pneumonia should receive an initial antibiotic dose within 4 h after arrival at the hospital [1]. One hundred percent compliance is expected, and performance will be tied to the level of reimbursement. Compliance with this measure is likely to prove to be difficult for some institutions—in particular, for inner city hospitals with overcrowded emergency departments. To identify issues that may make compliance difficult, Pines and colleagues retrospectively evaluated reasons for delay in the initiation of antibiotic therapy in patients with an admission diagnosis of pneumonia at 2 urban teaching hospitals in Pennsylvania.

Although 90% of 393 patients aged ≥18 years received antibiotics while they were still in the emergency department, only 43% at one hospital and 64% at the other received their first dose within 4 h after admission. The median time from triage to the order for antibiotics was 232 min, with an additional 40 minutes from order to administration, for a median total time of 272 min. Thus, the median time to antibiotic administration was 12 min longer than the 4 h allowed for each patient. The median time from triage to the order for radiography to be performed was 38 min, and from order to performance, the median time was 66 min. The median time from radiography performance to antibiotic order was 40 min, with the antibiotic administered 69 min after its order.

Only 76% of the 353 patients who received antibiotics in the emergency department ultimately had radiographic evidence of pneumonia that was confirmed by the attending radiologist. A diagnosis of pneumonia was made by CT for 10% of patients, and although interpretation of CT findings always occurred after the 4-h cutoff, one-half of patients received antibiotics before the findings were interpreted.

Patients with higher Pneumonia Severity Index scores were significantly more likely to receive an antibiotic within 4 h than were those with lower scores. Only 21 of 53 patients with histories not suggestive of pneumonia received early antibiotic therapy, and patients with nonclassic presentations were significantly more likely to die during their hospitalization.

This JCAHO-CMS measure is based on the results of 2 large retrospective studies that concluded that survival of patients aged ≥65 years admitted to the hospital...
with pneumonia was slightly—but significantly—increased when antibiotic therapy was initiated in a timely fashion (discussed in [1]). As pointed out, however, many potentially confounding factors, such as atypical presentation and the method by which the diagnosis of pneumonia is confirmed, were not taken into account in these studies. In particular, presentation with abdominal pain appears to frequently lead to a delay in the diagnosis of pneumonia. One study suggests that altered mental status is a critical confounder of pneumonia. Prioritization of patients with respiratory symptoms necessarily leads busy emergency departments to “deselect” other patients, with potentially adverse effects on their care. Preemptive administration of antibiotics to patients because they might possibly have pneumonia inevitably results in inappropriate antibiotic use, with attendant potential for toxicity and for emergence of antimicrobial resistance.

All of this suggests that this program requires a major overhaul based on an improved database. Although some modifications, such as changing the time at which the clock starts ticking from presentation to the time of diagnosis of pneumonia [5], are reported to be planned, it may be that much greater alterations may be necessary if an adverse result is to be avoided.

References
5. Houck PM. Antibiotics and pneumonia: is timing everything or just a cause of more problems? Chest 2006; 130:1–3.

Herpes Zoster Vaccination

The Shingles Prevention Study found that vaccination of adults aged ≥60 years against herpes zoster significantly reduced the risk of herpes zoster (relative risk reduction of 51.3%). Using a decision theoretical model and the results of that study, it was concluded that vaccination would slightly increase the subjects’ quality-adjusted survival. The benefit would be greater for persons who were vaccinated at 60–64 years of age than for those who were vaccinated at ≥80 years of age, although the benefit depends in part on the duration of vaccine-induced immunity, a characteristic that remains unknown. A vaccination cost of <$200 would be required to result in a cost of ≤$100,000 per quality-adjusted life year gained, a commonly accepted threshold for cost-effectiveness.

Bordetella pertussis Infection

A prospective cohort study in a British general practice found that 65 (37.2%) of 172 children aged 5–16 years who presented with a cough of ≥14 days’ duration had serologic evidence of recent infection with Bordetella pertussis. This occurred despite the fact that 86% of the children had received the full series of vaccinations.