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'Breathalyser' detects patients with Aspergillus pneumonia

Researchers from Boston, USA, report that identification of secondary metabolites of *Aspergillus fumigatus* in tidal breath accurately and non-invasively differentiates invasive aspergillosis pneumonia from pneumonia from other causes.

'We envisage that this technology could be adapted to a simple, rapid bedside breath gas detection system, which may allow for earlier diagnosis of invasive aspergillosis than is currently possible,' commented lead investigator Dr Sophia Koo.

The team had previously demonstrated in vitro that *A. fumigatus* emits a volatile organic compound profile of secondary metabolites that distinguishes it from other pathogenic mould species. This study included 54 immunocompromised cancer and transplant patients with suspected invasive aspergillosis, 29 of whom were ultimately diagnosed with invasive aspergillosis and 25 with pneumonia from other causes.

The researchers collected tidal breath from the patients, together with concurrent ambient air control samples on to thermal desorption traps retaining volatile organic compounds.

On gas chromatography-mass spectrometry, some volatile organic compounds produced by *A. fumigatus* in vitro were present equally in patients with or without invasive aspergillosis. However, the combination of farnesene and β-vatirenene and the farnesene derivative cis-geranylacetone correctly classified 27 of 29 patients with invasive aspergillosis and 24 of 25 patients without invasive aspergillosis – an overall 93% sensitivity and 96% specificity.

The team are now undertaking further studies to confirm these findings.

Sue Lyon

Koo S, Thomas HR, Rearden P et al (2013) An Aspergillus fumigatus (AF)-specific breath volatile organic compound (VOC) profile is diagnostic of invasive aspergillosis (IA). Abstract M219

High-dose oseltamivir may help critically ill H1N1 outcomes

Triple-dose therapy with oseltamivir is more likely than standard treatment to result in viral clearance in critically ill patients with severe pandemic (H1N1) influenza A, according to a study from Canada.

The double-blind, randomized controlled trial was conducted between October 2009 and May 2011 in 25 Canadian intensive care units. Fifty-nine critically ill patients were randomized to twice-daily treatment with either standard (75 mg) or triple-dose (225 mg) oseltamivir, started when patients presented, typically between 3 and 5 days after the start of symptoms.

Of the 56 patients eligible for analysis, 18 were polymerase chain reaction positive for pandemic H1N1 at study entry. On the primary endpoint of complete viral clearance at day 5 of therapy, seven of nine (78%) of patients receiving triple-dose oseltamivir were polymerase chain reaction negative compared to one of nine (11%) of those receiving standard therapy (P=0.015, Fisher's exact test).

There were no significant differences between the groups on the secondary endpoints (30-day, intensive care unit and hospital survival and duration of mechanical ventilation). Both oseltamivir doses were well tolerated.

Sue Lyon

Kumar A, the ROSII Study Investigators(2013) Viral clearance with standard or triple dose oseltamivir therapy in critically ill patients with pandemic (H1N1) 2009 influenza. Abstract V-1470

Raltegravir first-choice ART for HIV patients with cancer

Based on their efficacy and tolerability, integrase strand transfer inhibitors (INSTI) such as raltegravir appear to offer optimal antiretroviral therapy (ART) for HIV patients with haematological malignancies and those receiving chemotherapy. This finding comes from the largest series to analyse outcomes of antiretroviral therapy in patients with HIV and cancer, conducted by a team at the MD Anderson Cancer Center, Houston, USA.

The investigators analysed the records of 134 eligible antiretroviral therapy naïve or experienced adults with HIV and any type of cancer seen between January 2001 and December 2011. The patients received optimized background therapy plus antiretroviral therapy with protease inhibitors (40%), non-nucleoside reverse transcriptase inhibitors (NNRTI; 34%), raltegravir (the only INSTI available during the study period; 17%), or other treatment (11%).

At 6 months, INSTI and NNRTI were equally effective – defined as absence of virological failure or virological rebound. However, they were significantly more effective than protease inhibitors (62% *vs* 100% for INSTI and 96% for NNRTI; P=0.003). Side effects occurred more frequently with protease inhibitors and NNRTI (32% and 16% respectively) than with INSTI (5%) (P=0.02).

On multiple logistic regression analysis, an INSTI regimen was 21 times more effective (95% confidence interval 1.1–398.8) than a protease inhibitor-based regimen (P=0.046).

However, lead investigator Dr Harrys Torres warned: 'Our results should be interpreted with caution given the study's retrospective nature and lack of pharmacokinetic assessment.'

Sue Lyon

Torres HA, Rallapalli V, Saxena A, et al (2013) Efficacy and safety of antiretrovirals in HIV-infected patients with cancer. Abstract H-1255