in the meantime had developed a rhinitis and an ulcer on the right eye, were taken by the local medical staff. In July 2008, samples taken from the mother-in-law’s foot ulcer as well as from the corneal ulcer and the throat of the dog were found to be positive for MRSA.

Further analysis of these three MRSA strains and the one from the initial screening at the Small Animal Clinic was performed as described in Case 1. All four MRSA strains carried the gene mecA on an SCCmec type II cassette and were PVL-negative. The strains were resistant to penicillins (penicillin G, 16 mg/L; ampicillin, ≥8 mg/L; and oxacillin 8 mg/L), erythromycin (≥64 mg/L), clindamycin (≥128 mg/L) and enrofloxacin (≥32 mg/L). All isolates exhibited spa type t014 and MLST type ST225 (allelic profile 1-4-1-4-12-25-10). For all four strains indistinguishable macrorestriction patterns were generated by using the enzymes Smal as well as ApaI (Figure 1a and b).

Based on the epidemiological background data, the most likely route of transmission of the MRSA ST398 strain in Case 1 was from pigs to the veterinarian and subsequently from the veterinarian to his dog. MRSA ST398 strains have been reported to have their main reservoir in pigs, although such strains also occur in other animals and humans.9,10 The transfer of MRSA ST398 strains from colonized swine to swine farmers and veterinarians, and then further on to their family members has also been documented.11 Case 1 extends these observations by showing that pets sharing the same household may also become colonized. In Case 2, the mother-in-law appeared to be the source of the MRSA ST225 strain. Since the mother-in-law had not been tested for MRSA carriage prior to this study, it is not known for how long she had been carrying the strain. MRSA ST225 strains have frequently been found in humans, either as colonizers or as cause of infection.12 According to the MRSA statistics in Germany provided by the National Reference Laboratory for Staphylococci at the Robert Koch Institute (http://www.rki.de/cln_109/nn_1378492/DE/Content/Infekt/EpidBull/Archiv/2009/17_09/templateldd=raw.property=publicationFile.pdf/17_09.pdf), ST225 strains were the second most frequently detected MRSA strains among humans in Germany in 2007 and 2008. In contrast, MRSA ST225 strains have not been detected so far in dogs.5,6 These two case reports show that MRSA strains of different sequence types are readily transferred between humans and pets living in the same household. Moreover, these observations point towards the role of colonized pets as vectors of MRSA strains.

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Toxicokinetics of voriconazole during massive intentional poisoning

Hadrien Rozé*, Mathieu Lafargue†, Olivier Joannes-Boyau†, Hélène Batoz, Claire Dromer, Dominique Breilh and Gérard Janvier†

*Thoracic Intensive Care Department, Bordeaux University Hospital, Pessac, France; †Cardio-pulmonary Transplantation Department, Bordeaux University Hospital, Pessac, France; ‡Clinical Pharmacokinetics and Pharmacy Department, Bordeaux University Hospital, Pessac, France
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*Corresponding author. SAR 2, Hôpital Haut Lévêque, avenue Magellan, 33600 Pessac, France. Tel: +33-5-57-65-68-66; Fax: +33-5-57-65-68-11; E-mail: hadrien.roze@chu-bordeaux.fr

Sir,

We describe the case of a middle-aged man who intentionally poisoned himself with 9.8 g of voriconazole, 60 mg of prednisolone, 4 g of sulfamethoxazole, 2.5 g of azithromycin and 120 mg of bromazepam. This patient with cystic fibrosis had undergone bilateral lung transplantation 7 years previously. He had been treated for several weeks with voriconazole for invasive aspergillosis. He was found at his home, on the floor, in a state of altered consciousness. Several hours after the intoxication, he was intubated for airway protection, having arrived at our hospital via a county hospital.

The patient was sedated with midazolam and sufentanil, and mechanically ventilated. The chest X-ray was normal, a pulmonary fibroscopy was carried out and some gastric fluid was aspirated from the airway; the blood gases were normal, showing no signs of hypoxaemia. The patient had moderate rhabdomyolysis, with 1500 IU/L creatinine phosphokinase, and acute renal failure, with a clearance of 22 mL/min. We did not initially find any other biological abnormalities, and soon stopped the sedation in order to evaluate his consciousness. It was estimated that the patient arrived in our department 20 h after his intoxication. HPLC was used to measure serum voriconazole. The first voriconazole blood concentration was 30 mg/L (Figure 1). Forty-eight hours post-intoxication, the patient was awake but extremely agitated. His renal function rapidly improved without any respiratory or haemodynamic failure. The patient was extubated 72 h post-intoxication. Bilirubin, alkaline phosphatase, serum aspartate aminotransferase, serum alanine aminotransferase (ALT) and glutamyl transferase started to increase slightly 72 h post-intoxication. They rapidly increased to a maximal ALT value of 600 IU/L but without any clinical symptoms of liver failure. At 144 h (day 7), the patient was no longer agitated and was discharged from intensive care. A week later, the blood tests became normal. The patient was treated for his depression and aspergillosis.

Invasive aspergillosis is a life-threatening infection in an immunocompromised host and voriconazole is an effective treatment for this infection.\textsuperscript{1} Voriconazole is known to have neurotoxicity and frequently hepatotoxicity with elevation of liver enzymes.\textsuperscript{2,3} A relationship exists between voriconazole plasma concentrations and abnormal liver function values. The risk of developing elevated liver function values increases by 7%–17% for every 1 mg/L increase in the voriconazole plasma concentration.\textsuperscript{4} To our knowledge there is no description in the literature of a case of massive voriconazole overdose. In this case report the patient survived the intoxication but presented with signs of immediate neurological toxicity (confusion and agitation) and a delayed increase in liver enzymes at day 3, but without any clinical signs of liver failure. In the present case it is difficult to ascertain the role of each particular drug since both voriconazole and bromazepam can lead to neurological toxicity and elevated liver enzymes.

In summary, this report shows that a very large overdose of voriconazole with high blood levels does not necessarily result in severe clinical complications or death, but the patient should be followed up for several days due to the possibility of delayed hepatotoxicity.

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Figure 1. Serum voriconazole (mg/L).

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\textbf{Killing with kindness? Drug reaction eosinophilia with systemic symptoms (DRESS) masquerading as acute severe sepsis}

Philippa Horsfield\textsuperscript{1}, Sanjay Deshpande\textsuperscript{1} and Richard Ellis\textsuperscript{2,*}

\textsuperscript{1}Department of Intensive Care, South Tyneside District Hospital, South Shields, NE34 0PL, UK; \textsuperscript{2}Department of Microbiology, South Tyneside District Hospital, South Shields, NE34 0PL, UK