case suggests the possibility of ANCA-negative pauci-immune CrGN as a paraneoplastic syndrome.

Conflict of interest statement. None declared.

Shin-ichi Takeda1
Yasuhiro Ando1
Katsuhiro Nagata2
Joichi Usui3
Eiji Kusano1

1Division of Nephrology, Department of Medicine, Jichi Medical University, Tochigi, Japan
2Department of Internal Medicine, Ibaraki Prefectural Central Hospital, Ibaraki, Japan
3Pathophysiology of Renal Diseases, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Ibaraki, Japan
Email: nephando@jichi.ac.jp

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Bacterial infections following adjuvanted H1N1 vaccination in three renal transplant recipients

Dear Sir,

The current seasonal trivalent influenza vaccine is not effective against the influenza A(H1N1)v virus, and a new monovalent vaccine against A(H1N1)v was developed and fast-track licenced [1]. We report three renal transplant patients recently admitted with a serious bacterial infectious disease following adjuvanted A(H1N1)v vaccination.

Case 1: A 63-year-old male renal transplant (March 2003) recipient presented with subfebrile temperature of 37.9°C, cough and chest pain. Seven days before, he had been vaccinated against H1N1 by his general practitioner. For immunosuppression, cyclosporine A and prednisolone were taken. Chest X-ray showed a pneumonic infiltration in the right lower lung. Bronchoscopy was performed, and Chlamydia pneumoniae was cultured.

Case 2: A 46-year-old truck driver with a well-functioning renal transplant for 14 years experienced fever and malaise following H1N1 vaccination. He was commenced on sultamicillin for cystitis with a positive urine culture of enterococci. His immunosuppression was methylprednisolone and cyclosporin A. Since urine output declined, the patient presented to the emergency department, and intravenous ceftriaxone was begun.

Case 3: A 66-year-old renal transplant (March 2007) patient had received a H1N1 vaccination 1 week before developing cough, malaise and running nose. He pre-
sented to the transplant clinic 2 weeks later. Chest X-ray showed a pneumonic infiltrate in the lower lobe. For immunosuppression, he took prednisolone, cyclosporine A and mycophenolate mofetil. The patient was admitted for intravenous antibiotic therapy with ceftriaxone.

Prevention of influenza in organ transplant recipients is a crucial issue since evidence of the clinical effectiveness of immunization is lacking [2], and some reports on vaccination in kidney transplant patients suggest a diminished antibody response dependent on the type of immunosuppression [3].

Stimulation of a drug-modified immune system may result in unexpected reactions. The cell-mediated immune response peaks at 1 week after booster with inactivated influenza virus, but leukocyte migration is impaired [4]. Induction of inflammatory cytokines by Toll-like receptor agonists at or after the time of dendritic cell immunization prevented the early acquisition of memory characteristics of corresponding CD8 T cells and did not promote further expansion of responding CD8 T cells. Thus, the host default pathway of memory CD8 T-cell differentiation was deflected by encounter with cytokines [5].

All patients admitted in November 2009 suffered from bacterial infections after H1N1 vaccination (Table 1). No admissions in association with vaccination in renal transplant patients have been seen so far (Figure 1). It can be speculated that an adequate immune response to bacterial infection 1 week after H1N1 vaccination was prevented by a non-specific immune modulation due to the application of an adjuvant. Furthermore, close surveillance of the adjuvanted H1N1 vaccine is mandatory. Non-adjuvanted vaccines may be preferred in transplant patients until the safety of adjuvanted vaccines is proven in this group of patients.

### Table 1. Laboratory values of three renal transplant patients suffering from infection following H1N1 vaccination

| Laboratory test (normal value) | Case 1 | Case 2 | Case 3 |
|-------------------------------|--------|--------|--------|
| Haemoglobin (8.6–12.0 mmol/l) | 8.4    | 7.2    | 9.4    |
| White blood cells (3.8–9.8 Gpt/l) | 7.0    | 6.6    | 6.9    |
| Platelets (150–430 Gpt/l)     | 130    | 183    | 297    |
| Differential blood count     | Lymphopaenia 7.7% | Lymphopaenia 17.6% | Lymphopaenia 13.0% |
| CD4 cells (420–2210 Mpt/l)    | 128    | N/A    | 379    |
| CD8 cells (200–1190 Mpt/l)    | 37     | N/A    | 170    |
| CD4/CD8 ratio (0.6–2.8)       | 3.5    | N/A    | 2.2    |
| IgA (0.7–4.0 g/l)             | 2.34   | N/A    | 0.47   |
| IgG (7.0–16.0 g/l)            | 6.08   | N/A    | 11.58  |
| IgM (0.4–2.3 g/l)             | 0.68   | N/A    | 0.21   |
| INR                           | 3.8    | 0.98   | N/A    |
| Creatinine (35–106 µmol/l)    | 106    | 310    | 132    |
| Previous creatinine           | 168    | 177    | 156    |
| C-reactive protein (<5.0 mg/l) | 187.7  | 10.0   | 16.9   |
| Cyclosporin A (80–120 µg/l)   | 137    | N/A    | 98     |
| Urinary sediment              | Microhaematuria | Leucocyturia | Proteinuria 113 g/mol creatinine, microhaematuria |
| Microbiology                  | Chlamydia in bronchial lavage | Enterococci in urine | N/A     |
| A(H1N1)v HA gene RNA PCR      | Negative | N/A    | Negative |
| Anti-IgG A(H1N1)v             | 1:2480 | N/A    | 1:40   |
| Influenza antibody ELISA (IgA/IgG) | Positive/positive | N/A    | Positive/positive |

All values are in SI units. N/A, not available; INR international normalized ratio.

![Fig. 1. Cumulative monthly admissions of renal transplant patients according to the admission cause (primary transplant failure, any infection, other causes, i.e. diabetes). No other patients were admitted for infections following vaccination during the last 3 years, as confirmed by telephone survey.](image)
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1Department of Nephrology and Dialysis, HELIOS Kliniken Schwerin, Schwerin, Germany
2Department of Urology and Transplantation, University of Rostock, Rostock, Germany
3Department of Tropical Medicine and Nephrology, University of Rostock, Rostock, Germany

Email: norbert.richard.braun@t-online.de

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Renal resistance index—think of more than just the kidney

Sir,
In a recent Nephroquiz, Mitsides et al. describe Doppler ultrasound of the segmental renal arteries of a renal allograft obtained from a patient with bigeminus [1]. They and others point out that extrarenal factors can affect the intrarenal resistance index (RI) [2]. To extend the list of these factors, we want to report the case of a 60-year-old woman, who had preemptively received a living donor kidney allograft from her husband.

The cause of her renal disease was vascular nephropathy. Immunosuppressive therapy consisted of tacrolimus, mycophenolate and prednisolone, and she also received several antihypertensive drugs (metoprolol, indapamide, doxazosin, felodipine). The post-operative course was uneventful, and serum creatinine at discharge was 90 µmol/L. Despite normal renal function, a Doppler ultrasound of the allograft showed a complete absence of diastolic flow in the interlobar and segmental arteries, giving an RI of 1 (Figure 1). A transplant biopsy taken 6 months later showed a mild polyoma virus nephropathy. Acute rejec-

Fig. 1. Doppler signal of the distal segmental artery.