Unusual association of diseases/symptoms

Guillain–Barre syndrome associated with Norovirus infection

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Correspondence to Dr Khalid Gailani Eltayeb Registrar, drkg72@gmail.com**Summary**

The authors describe a case of Guillain–Barre syndrome after the diarrhoeal infection due to Norovirus. Many infections have been described most notably *Campylobacter jejuni*. To our knowledge a connection to Norovirus has not been described in the world literature. The authors speculate on why this may be so.

BACKGROUND

This is, to our best knowledge, the first case of norovirus-associated Guillain–Barre syndrome (GBS) case reported in the literature.

CASE PRESENTATION

A 46-year-old female, care-assistant was admitted to hospital with back pain and progressive ascending weakness and numbness of all four limbs. She worked in a nursing home with a proven outbreak of Norovirus diarrhoea; 13 residents had confirmed infection. She described a 36 h episode of vomiting and diarrhoea, 10 days before admission, which settled spontaneously. Her stool on admission was positive by PCR testing for Norovirus.

Neurological examination showed mild facial weakness, power of grade 4/5 (MRC Scale) in all four limbs with hyporeflexia and no objective sensory deficit. There was cerebrospinal fluid cytoalbumin dissociation with protein of 0.9 g/dl. She deteriorated with progressive weakness and respiratory failure necessitating intensive care unit admission and ventilation for 5 days. Her hospital stay was complicated with autonomic dysfunction.

INVESTIGATIONS

Serology for *Campylobacter jejuni*,^{1 2} Epstein–Barr virus,³ cytomegalovirus, herpes zoster virus, hepatitis A, B and C as well as Venereal Disease Research Laboratory was all negative. Antiganglioside antibody testing (including GM1, GM2, GD1a, GD1b and GQ1b) was negative. Stool culture for Norovirus as well as PCR test were both positive. Neurophysiology findings were consistent with an acquired demyelinating polyneuropathy and supported the diagnosis of GBS.

TREATMENT

She was treated with a 5 day course of intravenous immunoglobulin at 0.4 grams/kg/day.

OUTCOME AND FOLLOW-UP

She was hospitalised for 12 weeks including a period of rehabilitation. Her recovery was complicated by significant

pain requiring opiate analgesia. She has made a good recovery.

DISCUSSION

We report a case of GBS, which was temporally associated with Norovirus infection. She contracted this in a well-documented outbreak in a Nursing Home. Norovirus DNA was found by PCR in her stool. The timing suggests that Norovirus was the triggering organism. None of the other usual triggering organisms were found. While another trigger could have been the culprit, this does not seem plausible. We believe that this is the first documented report of a causal association with Norovirus.

Given that Norovirus is so common, it comes as a surprise that an association with GBS was not reported before. The link is therefore either real or spurious. If it is real there are a few reasons why the link was not established. The serology of Norovirus is technically difficult and not checked in routine clinical practice. In short-lived diarrhoeal illnesses, the PCR test for Norovirus may not be checked or may be negative when sought at the time of the onset of GBS (10 to 14 days later). It is possible that the immunological link is different (timing, location, IgA response etc.) and requires a unique set of circumstances to occur. Host factors may play a role, as yet undefined, in this process. This link may stimulate discussion of putative pathophysiological mechanisms (including molecular mimicry⁴) which might increase our understanding of what remains an important and dangerous disease.

Noroviruses⁵ belongs to the Caliciviridae family, causes nearly 50 per cent of all outbreaks of acute infectious, non-bacterial gastroenteritis in the USA.⁶ The diagnosis is suggested by acute diarrhoea and/or vomiting in a community outbreak setting. Noroviruses may be identified in stool specimens, and antibody can be measured in serum samples by immune electron microscopic or immunoassay techniques. This is usually not available in routine clinical practice.

Learning points

- ▶ GBS was associated with a definite case of Norovirus infection, which we speculate was causative.
- ▶ It is not clear why such a common infection should only trigger this response.
- ▶ Norovirus serology is not available in routine clinical practice which may explain, in part, why this association has not been found to date.

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Competing interests None.

Patient consent Obtained.

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