

TITLE: [Rapid diagnostics in gastrointestinal infections to avoid unnecessary costs for isolation]

Introduction

Gastrointestinal infections (GI) provoke inflammation of the gastrointestinal tract (gastroenteritis). They are caused by viruses, bacteria or parasites. Symptoms include diarrhea, vomiting, and abdominal pain. The main danger of GI is dehydration, which is why an intake of sufficient fluids is important. GI are among the most common infections in primary care. Although not all disease progression is fatal, GI can be dangerous in a particular medical setting or for certain patient populations. Some GI are particularly easily transmissible and therefore special rules apply here for handling these patients

Patients who are admitted to hospital in Germany with a suspected GI are usually isolated temporarily until definitive findings are available. The duration from the time of swabbing for a stool sample to the laboratory result varies between 48 and 72 hours. A patient may only be de-isolated if there is a finding that does not require isolation.

The polymerase chain reaction (PCR) based analysis panel makes it possible to obtain a laboratory result within a short time. Depending on the hospital-specific situation (location and operating hours of the laboratory), a result can be available after only a few hours (the test duration itself is approx. 1h) and provide information on the need for isolation. In addition, earlier specific treatment of the infection is possible.

In the analysis, a cost-benefit model was developed for a GI panel to provide hospitals with a valid economic decision-making basis for the cost-benefit ratio of rapid diagnostics.

Methods

Patients were grouped in:

- Non-infectious patients which were wrongly isolated (on suspicion) after results of the tests were available
- Patients with GI which were isolated correctly
 - GI Patients with no *Clostridioides difficile* (C. diff.)
 - C. diff. patients on normal ward
 - C. diff. patients on intensive care unit (ICU)

To determine the effects of the new panel, the rate of cases with pathogens not requiring isolation was determined. Furthermore, the average isolation time with conventional testing was compared to the average isolation time based on PCR.

To determine the average costs of the individual patient groups, cost data was obtained by the German Case Mix Office. For each relevant DRG, all costs were broken down to a daily basis to be able to simulate the effects.

Results

In 2020 there were 147.000 cases of GI in Germany. Approximately 30% had an infection requiring isolation. In total, there were about 17,000 cases with C. diff. infection, 6.5% were treated on ICU. Assuming that the results of the PCR test is available within 7 hours instead of 48 hours and that the new panel shows an overall reduction in length of stay of 1.49 days. The total cost per case is reduced from € 1,780.69 to € 1,232.26 when using the new panel. The cost of isolation decreases from € 265,00 to € 42,00 per case.

Conclusions

Rapid diagnostics proves again that higher test costs are offset by lower overall costs. This has already been investigated and confirmed in studies.