Prediction and prevention of infectious complications in children with cancer
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Implications for clinical practice and future trials
Implications for clinical practice

IL-8 and CRP should be measured on day 1 of clinical suspect neutropenic enterocolitis to stratify patients who have a high chance of being admitted to ICU and those at low risk of a severe course of neutropenic enterocolitis. In the high risk group inotropic support should be given in an early stage.

In patients who need a tunnelled central venous catheter, and who are at high risk of infections it should be implemented to give Gram-positive antibiotic cover prior to insertion of the catheter, or to flush the catheter with the combination of an antibiotic and heparin.

In patients at high risk of infections during neutropenic episodes SDD (TMP/SMZ or quinolones) should be used started prior to the onset of neutropenia.

Routine vaccination of VZV IgG-negative pediatric oncology patients is not yet warranted.

Implications for future research

The prevention of mucositis will ultimately lead to the prevention of neutropenic enterocolitis. Ongoing phase III cross over designed trial administering TGF-β (Transforming growth factor) as a mouth wash and added to the feeds as oral solution, to pediatric patients who are expected to develop a severe mucositis on the basis of the chemotherapy given.

Intervention trial in the predicted high-risk group of patients for neutropenic enterocolitis. If the high-risk group of patients is identified in an early stage of the disease, a RCT needs to be designed to administer granulocyte-transfusions to the high-risk group of patients, and to evaluate the severity and outcome of the neutropenic enterocolitis.

To extend the cohort of patients in which genotyping of MBL and serum levels of MBL are followed during febrile neutropenic episodes, gaining insight in the relation of MBL-deficiency and severity of infections. This allows us to identify the group of patients who might benefit most from MBL-substitution.

In vivo studies on tunnelled catheters to develop a coating system that will lead to reduction of catheter related infections for the entire duration of the catheter, without developing resistant organisms.
With our systematic review it was shown that Gram-positive catheter related infections can be decreased by using antibiotics prior to insertion of the catheter or flushing the catheter with an antibiotic and heparin. In the treatment of Gram-positive catheter related sepsis antibiotic lock therapy has proven to be of benefit in immuno-competent patients. No trials so far have been performed in the immuno-compromised pediatric patient. Therefore a randomised controlled trial needs to be performed, to apply antibiotic-lock therapy with or without systemic therapy to treat the Gram-positive catheter related infection.

Our preliminary study on vaccinating IgG-negative pediatric oncology patients in an early stage of their disease showed a high seroconversion-rate and is therefore promising. Before implementing this vaccination routinely a large trial on vaccinating IgG-negative VZV pediatric oncology patients early during treatment is necessary to gain further insight in immunogeneity, efficacy and adverse effects.