

Treatment of necrotizing soft tissue infections

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In this issue of NJCC, Mathoera et al describe the treatment of a necrotizing soft tissue infection, caused by invasive group A streptococcus after Trans Obturator Tape (TOT) placement, with additional polyclonal intravenous immunoglobulins [1]. Treatment of necrotizing soft tissue infection is most successful if it is recognized early and followed by surgical debridement, antibiotics and physiological support. After the first intervention close monitoring is mandatory to be sure complete debridement has been performed.

The incidence of necrotizing soft tissue infection is low and associated with co-morbidities such as diabetes mellitus, obesity and immune suppression. Not every physician will encounter more than a few cases during his or her professional career. Because of this low incidence, clinical suspicion is of the utmost importance. Oedema and erythema are signs that do not differentiate necrotizing soft tissue infection from cellulitis. The disproportionate pain must add to the suspicion, discolouration of the skin is a later sign and crepitus is not always apparent. Imaging studies can be helpful in identifying increased thickness of the fascia as well as gas. We must be aware that the often used term necrotising fasciitis stands for a subcutaneous infection with primary involvement of the subcutaneous fascia or scarpa, not easily shown on CT-scan or ultrasound.

One-third of these infections is caused by invasive group A streptococcus. Delay of treatment leads to devastating soft tissue necrosis and a high risk of mortality. Frozen section biopsy requires the availability of an experienced pathologist. Possibly, a small incision by an experienced surgeon on finding lack of resistance to finger dissection, (meaning easy dissection of the subcutis from the muscle fascia) would contribute towards a prompt diagnosis. As mentioned earlier: time is an important factor in this matter.

The message of the case report of Mathoera et al is not that immunoglobulins are now the treatment of choice for these patients. The main treatment is, after the diagnosis has been confirmed by CT scan and histopathology, necrotomy. Nevertheless, the authors decided to perform a 'limited necrotomy', indicating no excessive removal of tissue until completely normal tissue, with 'adjuvant immunoglobulin administration' and, of course, antibiotics. Importantly, repeated CT scans were used to evaluate any progression. In our view, it must have been a difficult decision to perform only limited surgery on a ventilated patient in septic shock, and it appears plausible that other care givers would have chosen more extensive surgery in a patient that ill.

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The use of immunoglobulins especially in invasive group A streptococcus infections, is controversial and studies are observational, or difficult to compare and the groups are small. To date, no randomized controlled trials are available. A recent meta-analysis [2] of the use of immunoglobulins in 2621 septic patients shows a overall survival benefit (risk ratio 0.74) compared to placebo or no intervention, resulting in a number needed of 9 to treat to save 1 life. Survival benefit seemed most prominent with higher doses and prolonged administration. The estimated costs for treatment in a septic patient with a bodyweight of 90 kg would be a 5000 to 6000 Euro in the Netherlands. Adverse effects range from mild (vomiting, chills) to severe (dyspnoea, allergic reaction, shock). Anecdotal evidence of adverse effects, such as renal failure, aseptic meningitis, thromboembolic events and viral infections appears to be very rare and possibly secondary to the disease rather than to the treatment regimen. Importantly, the trials included in the meta-analysis were conducted prior to the Bone criteria of sepsis, severe sepsis and septic shock and the current standards of treatment over the past decade including early goal-directed therapy, mechanical ventilation with small tidal volumes, strict glucose regulation, activated protein C, and low dose corticosteroids. The effect of immunoglobulins in the current setting is unknown.

We would like to emphasize that most important for the treatment of necrotizing soft tissue infection is early recognition and adequate surgical debridement with preservation of healthy skin, since antibiotic therapy alone is associated with a mortality rate approaching 100 percent [3]. Moreover, monitoring of this treatment during the first 6-48 hours with a scheduled inspection within 12 hours, and if necessary, repeat debridement are essential. Broad spectrum antimicrobial therapy is additional to source control and should be started as soon as possible covering Gram-positive, Gram-negative and anaerobe organisms until cultures are positive for a specific micro-organism and a smaller regimen can be started. Mortality in necrotizing soft tissue infection remains high, but is lowest in the early treatment group with complete surgical debridement.

In the case report published in this issue of the NJCC [1], a patient with the clinical classification of acute necrotising fasciitis after TOT placement was successfully treated by immunoglobulins in addition to 'conservative surgery' and antibiotics. Naturally, it is not clear to what extent the single infusion of immunoglobulins was of additional benefit for the recovery of this patient. Interestingly, in the recent meta-analysis [3] duration of immunoglobulin therapy of two days or less showed no survival benefit (risk ratio 0.98).

In conclusion, immunoglobulins may help to minimize surgical intervention and support the overall intensive care

treatment in a patient with group A streptococcus necrotizing soft tissue infection, but the data are very limited and we do not know in which patient it is possible to be less aggressive. The case report published in this issue of NJCC suggests that more conservative surgery may be possible, but due to the high mortality of the disease, extreme caution should be taken. Immunoglobulin therapy should be evaluated in well-defined population at high risk for death that receives the current standard of care for sepsis. In the future immunoglobulins may possibly help us to perform minimal

necrotomy and less devastating surgery, but more research will be needed before “less is more” can be the adagium in the surgical treatment of necrotizing soft tissue infection.

References

1. Mathoera RB et al. Necrotising fasciitis caused by invasive group A streptococcus after trans-obturator tape placement. *Neth J Crit Care*, 2007; 11 (5): 252-254.
2. Turgeon AF et al. Meta-analysis: Intravenous immunoglobulin in critically ill adult patients with sepsis. *Ann Intern Med* 2007; 146: 193-203.
3. Anaya A.D. et al. Necrotizing Soft-tissue infection: diagnosis and management. *Clin Inf Dis* 2007; 44:705-10.