OPENING REMARKS

This special issue of *Acta Medica Croatica* contains lectures presented at the symposium entitled *The Role of Biofilm in the Treatment of Ulcer*, organized by the Croatian Academy of Medical Sciences (CAMS) under patronage of Croatian Academy of Sciences and Arts, with valuable support from Stoma Medical, contributes to celebration of the 55th anniversary of successful CAMS activities. The issue brings state-of-the-art on the chronic venous disease including the etiopathogenesis, diagnosis, prevention and treatment of chronic ulcers.

Chronic venous disease is a public health and economic problem in Croatia, which today can be successfully prevented by early diagnosis and proper treatment. Complications are, unfortunately, quite frequently seen in daily routine. The application of advanced antimicrobial dressings targeting polyvalent biofilm in the wound is currently imperative for preventing complications and occurrence of chronic venous ulcers. Treatment of infected ulcer is for family doctor time-consuming and expensive. A number of diseases are also involved in the pathogenesis of ulceration including diabetes, obesity and peripheral vascular disease.

Today, it is scientifically proven that bacterial biofilm is responsible for difficult healing of the ulcer. The ulcer biofilm contains significant extracellular polymeric substances that enclose the bacteria and make a physical barrier for phagocytosis and complement activation, while preventing penetration of systemic antibiotics or locally applied antimicrobial agents. The presence of biofilm in the wound is a characteristic feature of chronic ulcer. In the treatment against biofilm, various treatments are used, such as debridement, antimicrobial agents, lavage, but results are not satisfactory. Modern methods of treatment for wound biofilm reduction have been scientifically studied, but they are not completely explained and used in practice. For example, molecular therapy with D-amino acid and with peptides that inhibit RNA, have been proven effective in *in vitro* and *in vivo* experiments, but its application is difficult in clinical practice. Despite the increasing knowledge about the mechanism of biofilm virulence, discovery of effective drugs has not progressed.

In the study by Akhil *et al*. from 2014, the authors applied local antibiotics and dressings with polyhexamethylene biguanide and Aquacel hydrofiber and Aquacel Ag + hidrofiber wraps as 'test dressings'. Test dressing with silver proved effective for multibacterial biofilm, particularly *Pseudomonas aeruginosa*.

Difficult or delayed ulcer healing is the result of excessive exudate in the ulcer, infection with multiple pathogens, and presence of biofilm that inhibits the ulcer healing process. Although there are many supportive dressings for chronic ulcers on the market, they are not used properly according to the clinical status of ulcers, while laboratory biochemical and bacteriological diagnosis generally is not obtained, let alone clinical and bacteriological identification of the biofilm. Modern antimicrobial dressings have the ability of destruction and prevention of biofilm reformation in ulcers.

In this thematic issue, experts in this field show in detail the results of successful research of chronic venous ulcers, from the diagnosis, necessary clinical and microbiological diagnosis of biofilm, to the results of clinical *in vivo* and *in vitro* research methods for biofilm removal. Antimicrobial dressings of the latest generation provide destruction and prevent formation of new biofilm in the ulcer.

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