

## NEUTROPHIL CHEMOTAXIS IN RECURRENT PYODERMA PATIENTS BY SKIN WINDOW TEST

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Pathogenesis of recurrent pyodermas is far from clear, but recent literature has stressed the importance of host defences especially the neutrophil function. Neutrophil chemotaxis was estimated in 32 patients of recurrent pyodermas and in equal number of controls by the skin window method of Rebeck and Crowley. No significant variation could be detected in the neutrophil chemotaxis among controls and patients ( $P > 0.05$ ).

**Key Words :** Pyoderma, Neutrophil Chemotaxis

### Introduction

Recurrence and chronicity of pyodermas in some persons with apparently normal health pose a frequent problem in clinical practice. Partial deficiencies of humoral or cellular immunity may be associated with these disorders. Although the importance of immunological defences was well recognised in these patients, the integrity of this system has not been adequately evaluated; especially the functional status of neutrophils except for a few isolated case reports.<sup>1,2</sup> Hence, we studied the neutrophil function (chemotaxis) by the skin window method<sup>3,4</sup> in patients with recurrent pyodermas to assess its role in the pathogenesis of this disorder.

### Materials and Methods

The study comprised of 32 patients with recurrent pyodermas (more than 2 episodes of pyoderma within a period of 6 months) uncomplicated by any other dermatological disorder. Adequate clinical evaluation was done in all these patients and the findings were recorded. Neutrophil chemotaxis was assessed by skin window test described by Rebeck and

Crowley<sup>3</sup> with minor modification.<sup>4</sup> A fixed area over the left forearm (10x10 mm) was abraded using a scalpel blade under aseptic conditions. Autoclaved *Staph. aureus* suspension coated on to a clean glass slide was applied over this abraded area on the forearm and held in place by an adhesive plaster. After a period of 3 hours, the slide was removed and stained by Leishman's method and the differential counts of various cells in the smear were estimated. Similarly, the test was carried out in an equal number of healthy young adult volunteers who served as controls.

### Results

Total duration of the disease varied from 4-144 months. The age of the patients ranged from 2 to 47 years with a male preponderance. The morphological lesions were impetigo, furuncles, folliculitis, ecthymatous ulcers. None of the patients had any associated systemic disease or immunodeficiency syndromes predisposing for pyoderma.

At the end of the test period, there was a copious collection of acute inflammatory cells in the skin window smears with a predominance of neutrophils (Fig 1). The mean number of inflammatory cells per oil immersion field was 23.3 in patients and 21.3 in controls. The difference between these groups was not

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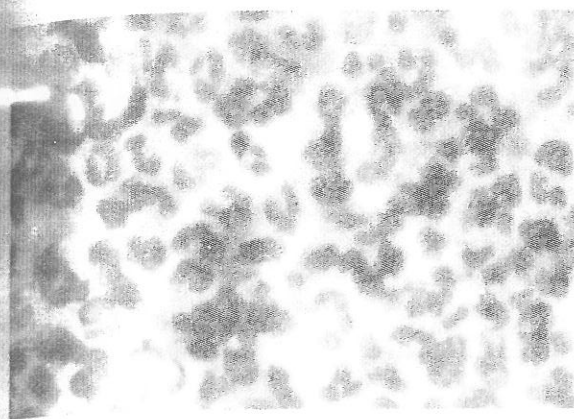


Fig. 1. Accumulation of acute inflammatory cells seen in the skin window smear (x1000).

statistically significant by the paired 't' test ( $P > 0.05$ ). Similarly, the difference between the mean percentages of neutrophils and eosinophils in patients and normal controls was also not significant ( $P > 0.05$ ) as shown in Table 1.

**Table 1.** Comparison of cells in skin window smears of controls and recurrent/recalcitrant pyoderma patients.

Skin Windows smears	Controls (n=32)			Pyoderma patients (n=32)		
	Range	Mean	S. D.	Range	Mean	S. D.
Total no. of cells/OIF	3.9 - 53.1	21.3	±14.6	0.5 - 59.3	23.3	15.8
Percentage of neutrophils/OIF	91.2 - 100	97.7	±2.4	92.2 - 100	97.8	2.1
Percentage of Eosinophils/OIF	0 - 8.8	2.3	±2.4	0 - 7.8	2.1	2.1

( $P > 0.05$ )

OIF-Oil Immersion Field

### Comments

Neutrophils play an important part of the host defence against pyogenic infections. A delay in the immigration of phagocytes at the site of bacterial invasion in as short a time as 2 hours has been shown to markedly increase severity of the infection.<sup>5</sup> Evaluation of neutrophil function includes tests of chemotaxis, adherence, phagocytosis and bactericidal capacity. Chemotaxis of neutrophils was assessed in the present study

since it is an important and also the first step in defence reaction.

Patients with recurrent pyogenic infections may represent a heterogenous group with different underlying causes. Recurrent pyoderma and impaired chemotaxis had been noted in earlier studies,<sup>1-6</sup> but some of these patients also had associated findings like eczema, increased Ig levels.<sup>2</sup> Possibly these patients had features of the "Hyperimmunoglobulinemia-E syndrome" characterized by markedly elevated serum IgE levels, eosinophilia, chronic dermatitis and recurrent skin and systemic infections.<sup>7</sup> However none of our patients had features suggestive of this syndrome.

Singh<sup>8</sup> observed that repeated infections can lead to increased severity of inflammation

and suggested that a hypersensitivity state could cause tissue damage to host and may play a role in the pathogenicity of recurrent infections in humans. Hypersensitivity to the bacterial antigen can be detected in the skin window test by the intensity of accumulation of eosinophils/basophils to the bacterial allergen applied on the denuded skin surface of the skin window.<sup>9</sup> No variation could be found in the eosinophil/basophil counts of the skin window smears in our patients.

In the present study, it has been

established that the neutrophil chemotaxis was normal in our patients. However other components of neutrophil function such as phagocytosis, bactericidal capacity need to be evaluated before excluding neutrophil dysfunction as a cause for recurrences.

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