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## Recurrence of fungal infections as a consequence of immunodepression, stress and inappropriate nutrition

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Ninety percent of immunodepression causes are related to prolonged stress situations, malnutrition or inappropriate nutrition, with a base pathology which constitutes a pathetic aggravating. These factors inevitably favour penetration of fungal species through epithelia and endothelia of our microbiota; opportunistic pathogens find an optimal and permissive host. Persistent emotional and nutritional disorders lead to metabolic stress<sup>(1)</sup> with hyperproduction of free radicals and increase of AMPc. The excess of free radicals impacts on skin causing tissue microlesions representing the entrance door to pathogens. Also, AMPc accumulation acts as negative modulator of cellular immunity, diminishing activity of T-cells and macrophages, and thus decreasing levels of interleukins, interferon  $\gamma$ , tissue necrosis factor and immunoglobulins, particularly IgA. This posed phenomenon manifests in innumerable cases through severe surface mycoses, in other cases leads to systemic and profound ones.

We analysed more than 4500 patients with mycosis of different degrees and placed them among base pathology bearers, which are most frequently found in those with diabetes<sup>(2)</sup>, hypothyroidism, metabolic syndrome, vasculopathy, obesity, alcoholism, drug dependency, cancer, prolonged treatment with corticosteroids. In all cases emotional stress is present, by the same pathology or aggravated by the environment.

Ten percent corresponded to psoriatic patients. The analysis of causes and manifestations made us conclude that mycotic colonisation of plaque has a key role in its formation, supported by immunological restrictions imposed by complexes of HLA-specific histocompatibility characterising these patients, with prolonged stress situations as main trigger. On this basis and with some probiotics<sup>(3)</sup> double-blind randomised studies were programmed, including a novel probiotic solution<sup>(2)</sup>, orally and topically administered.

With the orally applied application, the probiotic solution restored the immunomodulating action of intestinal mucosa, which is important to constitute 70% of body immune cells. Its topical application facilitates indispensable degradation of hyperkeratotic micaceous plaque produced by stimulus of fungal toxins in Toll-like II receptors<sup>(4)</sup> and TGF-beta1 skin growth factors. This degradation facilitates proper penetration of antifungal treatment, then applied according to sensibility test of found strain, following CLSI norms.

In psoriasis and dermatitis patients, we found clear predominance of *Malassezia* in its most common species: *furfur*, *sympodialis* and *globosa*, followed by *Rhodotorula rubra* and *Candida* and *Alternaria*. We complemented the treatment with a rich diet: fruits, vegetables, food with omega-3 and -9 and supplement of minerals and antioxidants. We suggested psychological support for specific cases.

Patients with placebo did not show improvement. But those treated with probiotic solution and antifungal agent had important lesion amelioration. By controlling immunodepression causes, we stopped mycotic advance with favourable responses on a shorter term and lesser cost.

1. Romeo J, Wärnberg J, Gómez-Martínez S *et al.* (2008) *Neuroimmunomodulation* **15**, 165–169.
2. Nowakowska D, Gaj Z, Nowakowska-Głab A *et al.* (2009) *Ginekol Pol* **80**, 207–212.
3. Weston S, Halbert A, Richmond P *et al.* (2005) *Arch Dis Child* **90**, 892–897.
4. Baroni A, Orlando M, Donnarumma G *et al.* (2006) *Arch Dermatol Res* **297**, 280–288.