

ROLE OF IRON DEFICIENCY ANAEMIA IN VAGINAL CANDIDIASIS

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SUMMARY

Candida albicans was persistently isolated in 36 pregnant cases who were having iron deficiency anaemia (I.D.A.). The I.D.A. induces histomorphological and immunological alteration which is suitable for the growth of candida albicans. The complete eradication of candida will not be possible until or otherwise I.D.A. is treated simultaneously.

Introduction

Iron, an essential metabolic ion, is required for the growth and metabolism of microorganism. Its deficiency results in (i) reduction in the phagocytic activity of polymorphonuclear leucocyte (Chandra, 1973), (ii) decrease in lymphocytic response to antigen, and (iii) promotes the growth of microorganism specially candida (Joynson *et al* 1972; Fletcher *et al* 1975), and (iv) brings about the histomorphological alteration (mucosal atrophy with increased keratinization (Rennie and Mac Donald, 1982; Rennie *et al* 1983). Though candida is one of common isolates from cases of chronic vaginitis in pregnant women in tropical countries, its relationship with iron deficiency anaemia was hardly ever documented. The present study is aimed to pin-point the association of chronic vaginitis (due to candida) with iron deficiency anaemia in pregnant women.

Material and Methods

The present study was carried out in

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Accepted for publication on 21-5-86.

the Postgraduate Department of Pathology and Microbiology and Department of Obstetrics and Gynaecology, S. N. Medical College, Agra, between the year 1980-1985. The pregnant women between the age of 20 to 35 years with one or more than one symptoms like white discharge in vulval region, or burning during micturition were considered. A haemogram including Hb%, TLC, DLC, ESR, PCV, was done. A high vaginal swab for fungus culture on Sabouraud's media was done. Serum tube identification of pathogenic candida was done by MacKenzie's technique (1982).

The follow up culture and haematological investigations after 1 month were done in cases receiving treatment for chronic vaginitis as well as anaemia and also in cases who were taking treatment for chronic vaginitis and avoiding or taking partial anti-anaemic treatment.

Observations

All the 500 cases were divided in two groups—Control group comprising of 100 pregnant women having history of chronic vaginitis and haemoglobin 10 gms% or more and, Study Group comprising of

400 pregnant women with history of chronic vaginitis and haemoglobin less than 10 gms%. On the basis of Hb% this group was further subdivided into 3 sub-groups as follows:

Subgroup (S-1): Hb. 7.1 to 10 gms%

Subgroup (S-2): Hb. 4.1 to 7 gms%

Subgroup (S-3): Hb. less than 4 gms%.

The distribution of all cases with respect to age and haemoglobin percentage has been shown in the following Table:

The candida was isolated in 10 cases in control group and 109 cases (27.25%) in study group. Out of the 109 cases, only

103 were available for follow up in study group and 6 cases in control group. Out of these 103 cases complete anti-anaemic as well as anti-fungal treatment was taken in 76 cases, while 27 cases had their partial or no anti-anaemic treatment but had use of anti-fungal cream/vaginal tablets. The distribution of persistent positive culture for candida in various subgroups has been shown in Table II.

Discussion

Transferrin, an iron, containing protein having bacteriostatic and fungicidal effect

TABLE I Distribution of Cases With Respect to Age and Haemoglobin Percentage

S. No.	Age Groups (Years)	Control Group (C)	Study Group (S)		
			S-1	S-2	S-3
1	20-25	40	86	25	46
2	26-30	51	138	40	29
3	31-35	09	80	30	26
Total		100	304	95	101

TABLE II

Persistent Positive Isolation of Candida in Patients With/Without Anti-anaemic Treatment

Name of Group	No. of cases with anti-anaemic treatment			No. of cases with partial or no anti-anaemic treatment		
	Positive Candida in			Positive Candida in		
	First Culture	Second Culture	%	First Culture	Second Culture	%
Control Group	10	1	10.0	—	—	—
Study Group S-1	20	2	10.0	5	3	60.0
S-2	27	4	14.9	9	8	88.9
S-3	29	7	24.1	13	12	92.3
Total of Study Group	76	13 (17.1%)		27	23 (85.2%)	

Statistical significance between patients with/without anti-anaemic treatment:

	Z	p value	Significance
S-1	2.19	<0.5	Significant
S-2	5.92	<0.001	Highly significant
S-3	7.55	<0.001	Highly significant
Total Cases	8.39	<0.001	Highly significant

(Schade and Carolin, 1946) is reduced in I.D.A. In I.D.A. there is not only alteration in the histomorphological alteration of oral mucosa in the form of atrophy of epithelial cells (Higgs and Wells, 1972; Rennie and MacDonald, 1982; Rennie *et al* 1983), but also an alteration in immune response including reduction of phagocytic activity of polymorphonuclear leucocyte (Chandra, 1973) and myeloperoxidase activity (Klebanoff, 1970). The vaginal surface epithelium in chronic vulvo-vaginitis and endocervicitis undergoes partial atrophic changes including flattening, cuboidal, or desquamated changes with oedema and subepithelial inflammatory infiltration by plasma cells and other mononuclear cells (Novak and Woodruff, 1974). Pregnancy further increases the congestion.

This morphological change in the form of partial atrophy of mucosa reduces its vitality to hold the normal flora of vagina and facilitates the candida to grow (Russel and Jones, 1973). Further the fungicidal effect of transferrin and altered response in I.D.A. further adds to the failure to hold normal microbial flora (Russel and Jones, 1973; Sofaer *et al* 1982; Rennie *et al* 1983; Winner, 1969).

Our observation of persistent isolation of candida in the group taking incomplete or no anti-anaemic treatment had much higher percentage (23 cases—85.2%) in comparison with the group taking regular anti-anaemic treatment (13 cases—17.1%). Even in previous group percentage of isolation was higher in more anaemic patients than the less anaemic patients (10% in S-1, 14.8% in S-2 and 24.1% in S-3 subgroups) while in control group only 1 case (10%) had persistent isolation. This clearly signifies that higher is the degree of anaemia

more frequent is isolation. This is statistically also significant.

Therefore, altered histomorphological changes with altered immune response (Chandra *et al* 1973; Joynson *et al* 1972; Rennie *et al* 1983; Bataillard, 1985) all grouped together are responsible for facilitating candida growth. It can not be completely eradicated unless the underlying anaemia is corrected. Failure of which will result the incomplete eradication and early relapse even with best medication.

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