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IMPACT OF SPIRULINA *FUSIFORMIS* ADMINISTRATION ON ERYTHROCYTE SEDIMENTATION RATES

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In the present study, impacts of *Spirulina fusiformis* administration were studied on erythrocyte sedimentation rates (ESR) of human objects. This systematic clinical study included agewise and genderwise effects. Erythrocyte Sedimentation Rate (ESR) of human objects, administered with *Spirulina* showed great reduction. Reduction in Erythrocyte Sedimentation rate may be due to the suppression of allergic IgE and reduction in release of histamine due to *Spirulina* administration.

Keywords: Erythrocyte Sedimentation Rates, Male and Female patients, *Spirulina fusiformis*.

Introduction

As mentioned in the Rigveda, some herbs used for their curative properties seem to be the earliest record of use of plants in medicine. A more detailed account is available in the Atharvaveda. Gradually more & more plants found recognition and entry into the native system of medicinal herbs[1]. In the same concern, cyanobacterium *Spirulina* is gaining more & more attention due to its pharmaceutical properties. Its tremendous nutritional potential and therapeutic impacts have led to several clinical studies on its different chemopreventive effects.

Erythrocyte sedimentation rate (ESR) is used as a valuable laboratory tool in evaluation of infectious, inflammatory, and malignant diseases[2, 3]. The rate of sedimentation in a period of one hour called ESR. It is a common hematologic nonspecific indicator of inflammation[2].

Red blood cells in outside from the body precipitate due to their higher density than the plasma; in normal state these cells reject each other because of their negative surface charges and prevent Rolex formation[4].

As such there are very stray reports regarding effect of *Spirulina* administration on erythrocyte sedimentation rates. Actually some studies are conducted on the immunity purposes but not directly showed impact on ESR. The present study deals with the effect of *Spirulina fusiformis* administration on ESR of human objects. In this systematic clinical study effects were studied agewise and genderwise

Material and Methods

The study was carried out on the males and females of age group falling between 40-70 years. Candidates suffering with the serious heart disease and women undergoing pregnancy were excluded from this study. They were accepted for *Spirulina* administration orally.

192 candidates were considered to perform clinical study. Candidates were dividing into the range of different groups

.(i) 40-49 yrs of age.

(ii) 50-59 yrs of age.
(iii) 60-69 yrs of age.
In each age group, 4 sets of candidates were present and each set have 8 males & 8 females. One week of wash out period given to the candidates. One gram *Spirulina fusiformis* per day administered orally to them for a period of 30 days. Human objects took regular dose of *Spirulina fusiformis*, before every meal & they did not change their habit.
Initially, 12-14 hr. fasted blood samples were collected from candidates and then blood samples were collected and tested for ESR at 0, 15th & 30th day of *Spirulina fusiformis* administration. Westergren method was performed to test ESR. In this blood sample was collected in EDTA vialsto stop clotting and then placed in a vertical tube (Westergren) and erythrocyte sedimentation rate is measured in units of mm/h.

Results and Discussion

After the administration of cyanobacterium *Spirulina fusiformis* to above selected groups, a considerable reduction was recorded in the erythrocyte sedimentation rates (Fig.1, 2, 3).
Erythrocyte Sedimentation Rates (ESR) of human objects, administered with *Spirulina* showed great reduction. Observation during the present study revealed that male candidates of all the three age groups showed highly reduced ESR after 30 days of experiment than the female candidates (Fig.1, 2, 3). Maximum reduction in ESR for males was obtained at the age of 50-59 yrs while female candidates showed maximum reduction at 40-49 yrs of age (Fig.1, 2). Thus, in the females of 40-49 yrs and males of 50-59 yrs *Spirulina* worked more effectively against any acute or chronic infections than the other sequence of age groups. These results are similar with the results of other researches who stated that ESR levels increases with age and are higher in women [2, 4, 5].
ESR reflected changes in plasma proteins (globulin pattern & concentration) which were accompanied by most of the acute or chronic infections and allergic reactions. Increase in ESR indicated the continuous or increased activity of the disease process, while a decrease should be taken as a sign of arrest of the process. *Spirulina* was consumed by the people in the early 1970s and there were no reports of allergies or sensitivities, which approved the present results. *Spirulina* inhibited allergic reactions by suppressing the release of histamine.
Animal studies showed that *Spirulina* phycocyanin regulate bone marrow cells. These cells produce WBC and stimulate healthy immune system[6].
In 1994, a Russian patent was awarded to Evets *et al*.[7] for *Spirulina* to normalized allergic sensitivities in children of Chernobyl. He observed that children of Chernobyl, highly radioactive area showed normalized IgE levels due to the administration of *Spirulina*.
All these facts supported important role of *Spirulina* in strengthening the immune system and reduction in infectious status of blood.

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Fig.1: Impact of *Spirulina fusiformis* administration on the Erythrocyte Sedimentation Rate

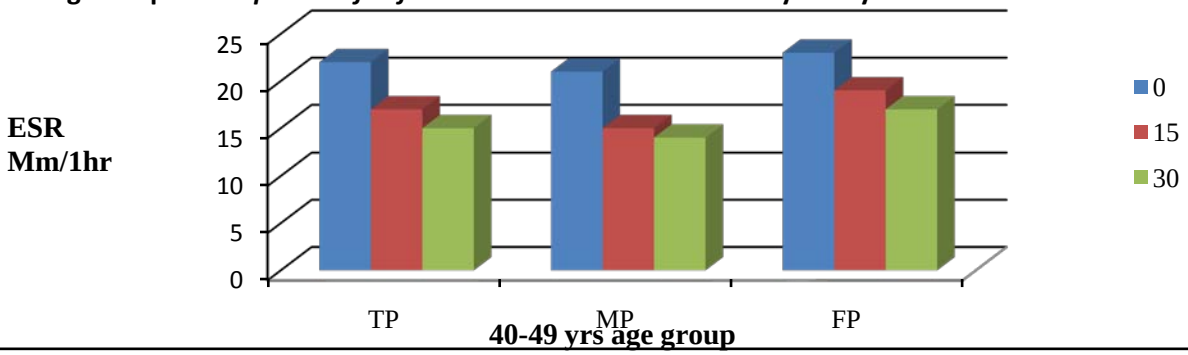


Fig.2: Impact of *Spirulina fusiformis* administration on the Erythrocyte Sedimentation Rate

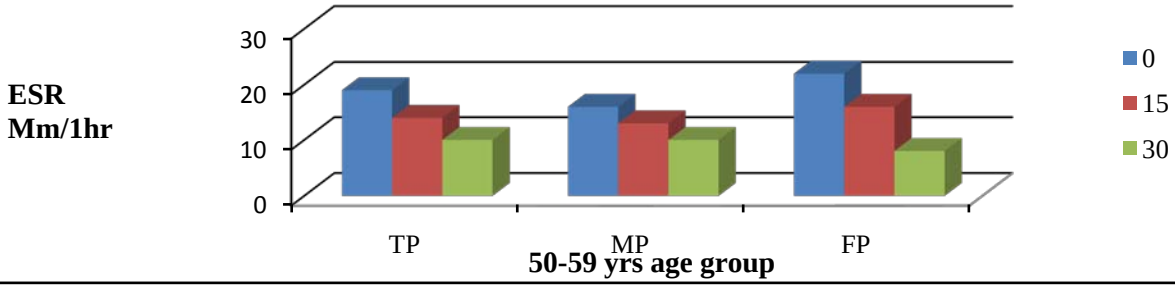
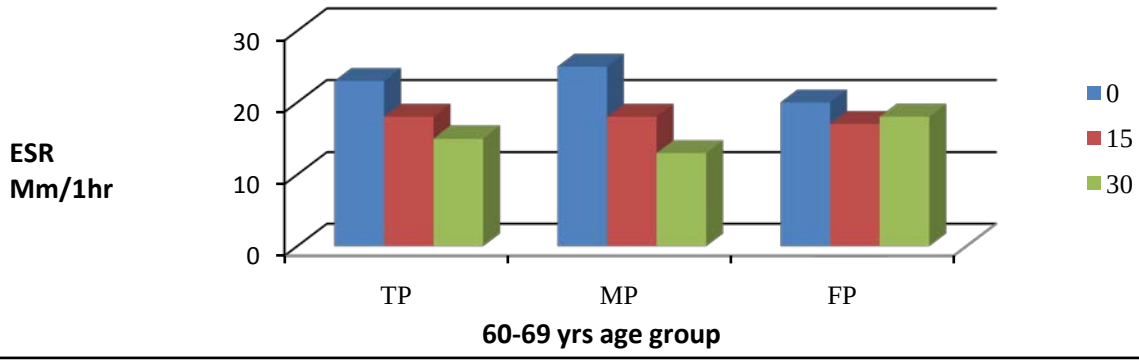


Fig.3: Impact of *Spirulina fusiformis* administration on the Erythrocyte Sedimentation Rate



Permissible limit for male candidates = 0-5 Mm/1 hr.
Permissible limit for female candidates = 0-7 Mm/1 hr.
TP = Total Patients
MP = Male Patients
FP = Female Patients

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