ISSN 2250-3153

Growth Rate of Plasmodium Gallinaceum in the Malaria Infected Chicks Due to Stilbestrol Treatment

Dr. A. Kalyani

Abstract- The diethyl stilbestrol is a synthetic estrogen was given orally into male and female chicks to study its effect on the immune system. The chicks were taken in different age groups such as one week and four weeks. The chicks were experimentally infected with plasmodium to find out the growth rate in the malarial infection. In this study the parasitemia in stilbestrol treated male and female chicks was more than in control chicks

Index Terms- Plasmodium gallinaceum, Stilbestrol, chicks

I. INTRODUCTION

The malaria species which has been commonly used for experimental study of avian immunity is Plasmodium gallinaceumBrumpt, (1935), a parasite of jungle fowl which is transmissible to the domesticated chickens.

Immunity may be suppressed through several ways. Eg. Ablation of lymphoid tissue, inhibition of uptake, X-ray or through various drugs (Edward,1970). Steroids are one of them which are used to depress the immune response of the recipients'. The phenomenon of age resistance is well known in bird malaria. The infections in the younger animals are usually more sever than in older once. According to Raffaele and (1950), Galliard and lapierre (1915), Hsu and Geiman (1952), the influence of age is indisputable, the young animals being more susceptible than adults. This was observed by Zuckerman and Yoeli(1954), Spira et all(1970) in rats, Bhatia and Vinayak (1984), who revealed that as the age of the host advance the degree of parasitemia became lower and the morality decreased.

II. METHODS AND MATERIALS

The present research works the male and female leghorn chicks were produced from Tirumala hatcheries, Hanamkonda. These chicks were maintained under modern poultry methods. They were vaccinated and provided with a 100volts bulb on the cage for maintaining suitable temperature. The chickens were given balanced feed. Plasmodium gallinaceum used in this study was maintained by syringe passage in male and female leghorn chicks.

To study the effect of diethyl stilbestrol on Plasmodium gallinaceum infection two batches of 12 chicks with different age groups, one week and four week old age were taken. The weight of the chicks and Hb was observed before the experiment. They were given oral tablets consisting of 0.25mg of stilbestrol drug daily for 6 days and followed by 0.5ml of inoculum of Plasmodium gallinaceum infected blood.

The chicks were bled when the infection was heavy, and the infected blood was collected in sterilized tubes. The serum was collected and stored at -4^{o}c. A batch of one week and four week chicks were given Plasmodium gallinaceum without any drug. Another batch of one week and four week chicks were given after 6days of drug treatment Plsmodiumgallinaceum and these chicks were examined for infection. All dreg treated and controlled, one week and four week old chicks were examined daily for the presence of plasmodium stages.

The same procedure was used to female chicks, the blood was collected from all the chicks during peak infection and they were examined for the presence of Plasmodium stages.

III. RESULTS AND DISCUSSION

The stilbestrol treated one week old male chicks Plasmodium gallinaceum infection appeared on the first day, one day earlier than the control chicks and the parasitemia was 5/100, then infection gradually increased from 1st day to 9thday.On the 9th day the parasitemia was 30/100, on 9th day chicks died of the high infection.(Fig no.2a).

In controlled chicks the infection was seen on 2nd day and the infection was 5/100, the infection gradually increased from 1st day to 10th day and the parasitemia was 28/100. The infection gradually decreased and disappeared on 18th day.(fig no 2a).

In the first week female stilbestrol treated chicks the parasitemia on 1st day was 5/100,then increased up to 9th day with parasitemia 32/100. The chicks died on 9th day. .In first week female controlled chicks the infection was seen on 2nd day and on the 1st day of infection the parasitemia was 4/100, then increased up to 10th day with Parasitemia was 29/100. Then infection decreased gradually and disappeared on 18th day. (fig.no.2b).

In stilbestrol treated four week male chicks Plasmodium gallinaceum infection appeared on 2nd day and the parasitemia was 3/100. The infection gradually increased from 1st day to 9th day and parasitemia was 27/100. Then infection gradually decreased up to 13th with parasitemia 15/100. Again the infection gradually increased up to 15th and the parasitemia was 28/100. O n the 15th day chicks died (fig no.2a).

In four week old male control chicks the infection appeared on the 3rd day after inoculation when the parasitemia was 4/100. The infection gradually increased from 1st day and on 10th day the parasitemia was 24/100, then the infection gradually decreased and disappeared on 20th day.(fig no.2a)

In stilbestrol treated four week female chicks Plasmodium infection appeared on 2nd day and the parasitemia was 5/100. The infection gradually increased from 1st day to 9th day and the parasitemia was 25/100.Then the infection gradually decreases

up to 13th day with parasitemia 17/100. Again the infection gradually increased up to 15th day and the parasitemia was 28/100. On 15th Day the chicks died. (fig no.2b).

FIG 2.A. EFFECT OF STILBESTROL ON THE IMMUNE RESPONSE TO PLASMODIUM GALLINACEUM IN THE MALE EXPERIMENTAL MODELS

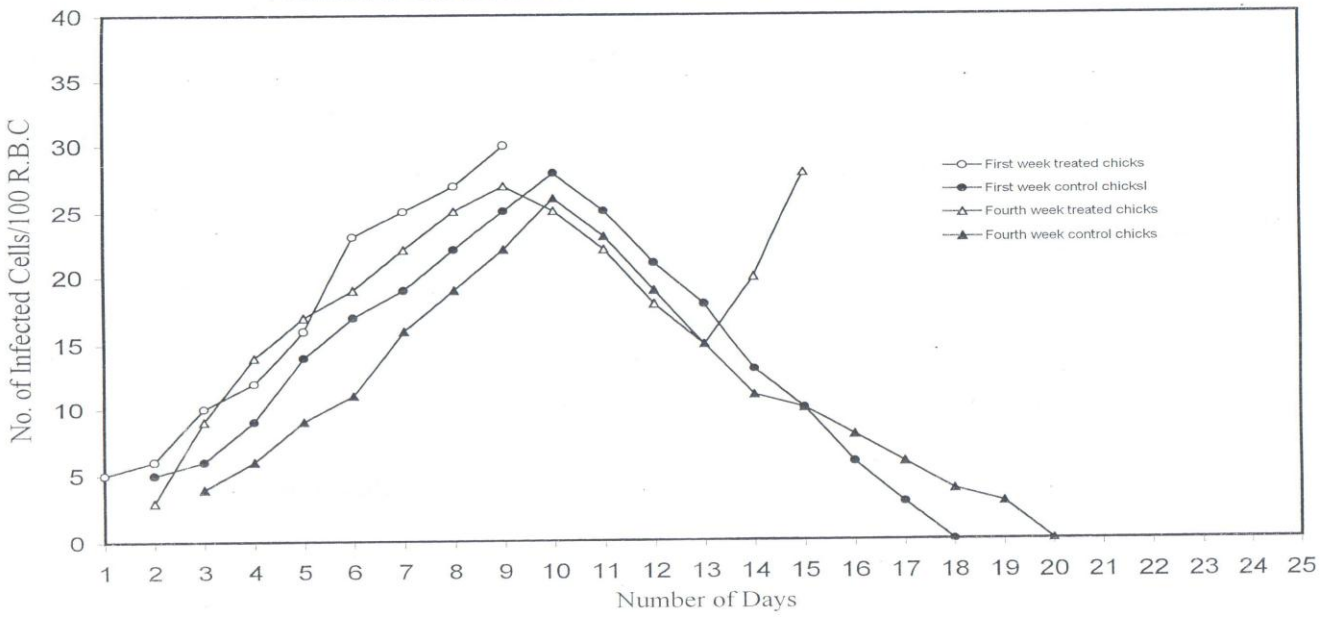
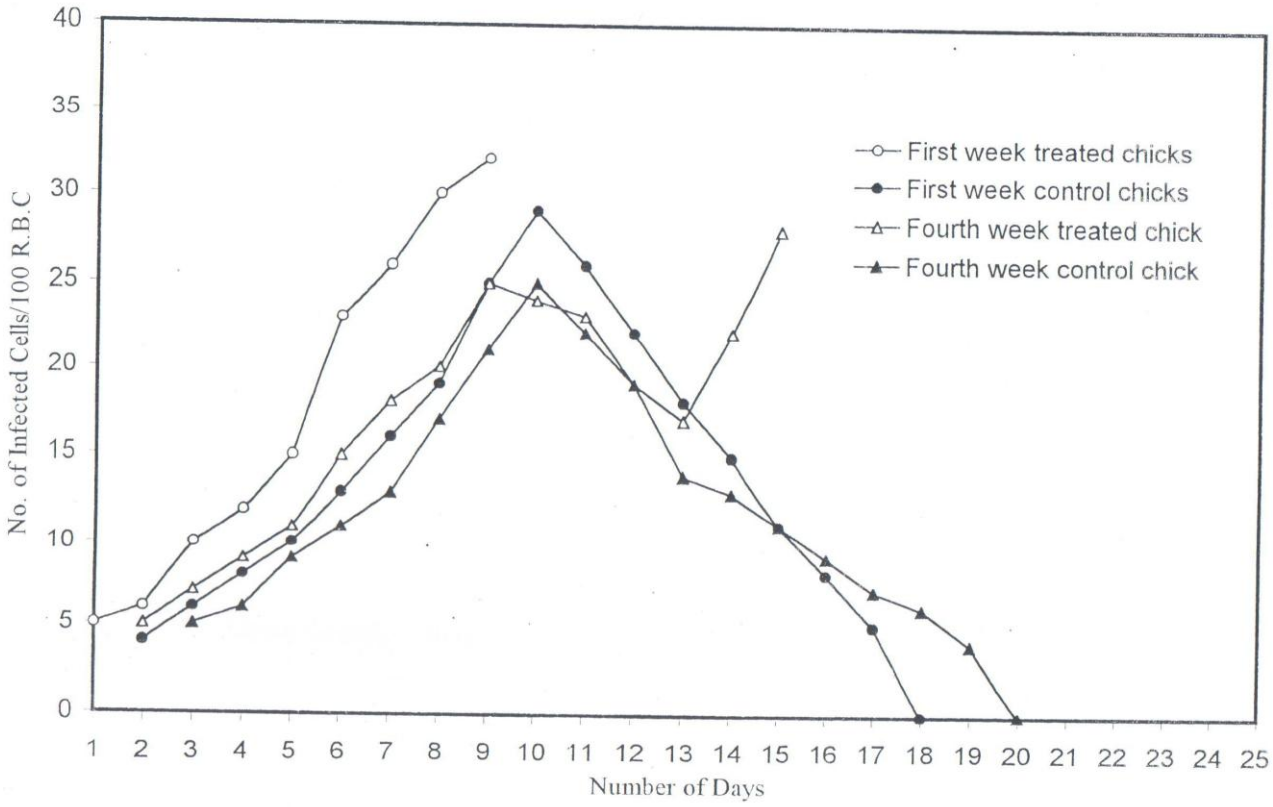


FIG 2.B. EFFECT OF STILBESTROL ON THE IMMUNE RESPONSE TO PLASMODIUM GALLINACEUM IN THE FEMALE EXPERIMENTAL MODELS



In stilbestrol treated four week male chicks Plasmodium gallinaceum infection appeared on 2nd day and the parasitemiawas 3/100. The infection gradually increased from 1st day to 9th day and parasitemia was 27/100. Then infection

gradually decreased up to 13th with parasitemia 15/100. Again the infection gradually increased up to 15th and the parasitemia was 28/100. O n the 15th day chicks died (fig no.2a).

In four week old male control chicks the infection appeared on the 3rd day after inoculation when the parasitemia was 4/100. The infection gradually increased from 1st day and on 10th day the parasitemia was 24/100, then the infection gradually decreased and disappeared on 20th day.(fig no.2a)

In stilbestrol treated four week female chicks Plasmodium infection appeared on 2nd day and the parasitemia was 5/100. The infection gradually increased from 1st day to 9th day and the parasitemia was 25/100.Then the infection gradually decreases up to 13th day with parasitemia 17/100. Again the infection gradually increased up to 15th day and the parasitemia was 28/100. On 15th Day the chicks died. (fig no.2b).

In four week old female control chicks the infection appeared on the 3rd day after inoculation when the parasitemia was 5/100. Next the infection gradually increased and on 10th day the infection reached to the peak, with parasitemia 25/100, then the infection gradually decreased and disappeared on 20th day. (fig no.2b).

Steroids are potent immunosuppressive agents and act in several ways like inhibitory cell proliferative response, reducing the circulating lymphocytes, reducing the relative and absolute number of heterophils, destroying thymus, bursa cells inhibiting the uptake and processing of antigen, suppressing the cell mediated immune response (Albin et al 1978).

During the present investigation it was found that administration of stilbestrol which is sexual steroid hormone reduced the prepatant period and survival time than the control. Higher levels of parasitemia were observed in treated chicks.

Selveraj and Pitchappan (1985) stated in their reports that the differential susceptibility of the host further suggests that the immune response may be influenced by the endogenous hormonal level. Treatment with hormones enhanced the parasitemia in the present study the parasitemia increased in hormone treated chicks of male and females.

Reydon and mecain (1947) stated that many investigations have recognized that parasitemia drops rapidly after the peak .the level of parasitemia reached to the peak and dropped rapidly in the present investigation also.The present study revealed that the age of the host advanced the degree of parasitemia became less and mortality decreased.

Similar observations was made by Zuckerman and yoeli (1954), spiraet all (1970). Brumpt (1936) showed that highest morality in plasmodium gallinaceum is in young birds and resistance is connected with age.

Herman(1975)'s study showed the peak was reached on the same day in all the birds of different age groups but in the present results peak reached at different number of days in different age group chicks.

In this study the stilbestrol treated one week chicks four week chicks of both sexes died of infection and agree with Sharma (1977) and Perey (1973) results.

REFERENCES

[1] Albin, R.J,; Bhatia, R.A. and Guinan, P.O.(1978).Effect of estrogen on tumor-associated immunity in patients with a deno-carcinoma of the prostate cancer Research 38;p,3702.

[2] Brumpt,E.(1936) Paludisme aviaire; P.gallinaceum n.sp.De lapoule domestique. C.r.hebd Scanc Acad.Sci. Paris;p.783-786.

[3] Edward,A.C(1970) in biology of the immune response, peter and Madano, Mc.Graw Hill book comp. Newyark.

[4] Herman, C.M.(1975).p.Circumflexum Age as a factor in isodiagnosis in A natidae.Exper.parst.38;p83-86.

[5] Reydon,R.H. and Hecain (1947). Some factors that influence the degree of parasitemia in ducts, infected with P.lophurae.Amer.J.Trop.Med.27; p. 673-681.

[6] Selveraj.P. and Pitchappan.R.M. (1985).Effect of oestrodiol diproprinate on the immune system of the pigeon, Columba livia. Developmental and comparative Immunology.Vol.9;p.669-677.

[7] Sharma, J.M. and Lee, L.F.(1977).Supressiveeffect of cytophosphamide on the t-cell system in chickens. Infec. Immun.17 ;p.27-230.

[8] Spira, D.T.; Silverman, P.H and Gaines, S.C.(1970). Antithymocyte serum affection .P.bergei infection in rates. Immunology,19; p.759.

[9] Zuckerman,A. and yoeli (1954), Age and Sex as factors influencing P.berghei infection in intact and Splenectoinized rats. J.infect.Dis.94;p 225.

AUTHOR

Dr.A.KALYANI,Ho.no.-5-2-229,--
Musthafanagar,KHAMMAM—(po), ANDHRAPRADESH—INDIA—507001.
E-mail id ---jujjuri.venkat@gmail.com
Mobile. No. 09885585409