



THE EFFECT OF SENESCENCE AND SMOKE ON HUMAN IMMUNOGLOBULIN CONCENTRATIONS

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ABSTRACT

Smoking stimulates IgE mediated hypersensitivity response in up 87% both in youths (25-35Ys) and senescent (60-7 Ys). Smoking decreases the concentrations of total globulins and IgM in senescent subjects, but have no significant effect on IgG concentrations among both youth and senescent subjects.

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1. INTRODUCTION

Ageing and longevity are the normal human life extremes and associated with decrease of humoral immune response as well as increase in humoral autoimmune response [1]. Senescence affect immune system, and smoke do so as well [2, 3]. The present work was aimed at determination of ageing, aging and smoking effects on total globulin and immunoglobulin isotype concentrations.

1.1. Materials and Methods

-Thirty- two human subjects were elected as a test group. Of which 16 were smokers and subdivided into youths (25-35 Y) and senescent (60-75Y). Like wise the other 16 were non smokers. Of which eight youths and eight senescent. Blood collected from brachial vein by disposable 5 cc syringes and tornicate. Sera were saved. Total globulin was separated and concentration determined [4]. Five microliters of sera were applied into wells of IgM, IgG and IgA specific gels [5]. The incubated for 48 hr. at room temperature.

Diameters of precipitation zones read to the nearest millimeter and matched with standard concentration table of the manufacturer.

Two tailed t- test was as in the following

$$t_{7+7} = \frac{\left| \bar{Y}_1 - \bar{Y}_2 \right|}{\sqrt{SE_1^2 + SE_2^2}}$$

2. RESULTS

1- IgE

The rate of positive IgE among young non smoker was 12.5% while among young smokers was 87.5% like wise .It was 37.5% among senescence non smokers and 87.5 % among smokers senescent. (Tables 1-4), pie diagram a –d (Fig.1) .

2- IgA

Smoking cause increase in IgA levels among youth smokers as compared to youths, non smokers .Two tailed t statistics for the difference between the means was significant at level of p :0.1 .These difference were non significant among smoker senescence as compared non smoker senescence. If the age is not considered as influencing factor , the difference between smokers and non smokers was not significant .

(t_{15+15} 0.6220)[table 1 and fig. a]

3- IgM

Smoking decreases IgM concentration in senescent subject . Two tailed t statistics have shown significant difference between non- smokers and smokers(at level of P 0.2&0.1). Senescence and smoking induce decrease in IgM .levels as compared to youth non smokers as shown by two tailed t test to the difference between means of senescent smokers and youth non smokers at the level of p. 0.1 and 0.2 (Fig.2).

4- IgG

The smoking effect on IgG in youths, senescence and on avoiding ageing effect were non significant as difference between smokers and non smokers are being concerned. (t_{15+15} : 0.2357) .(tables 1-4 & Fig. 2)

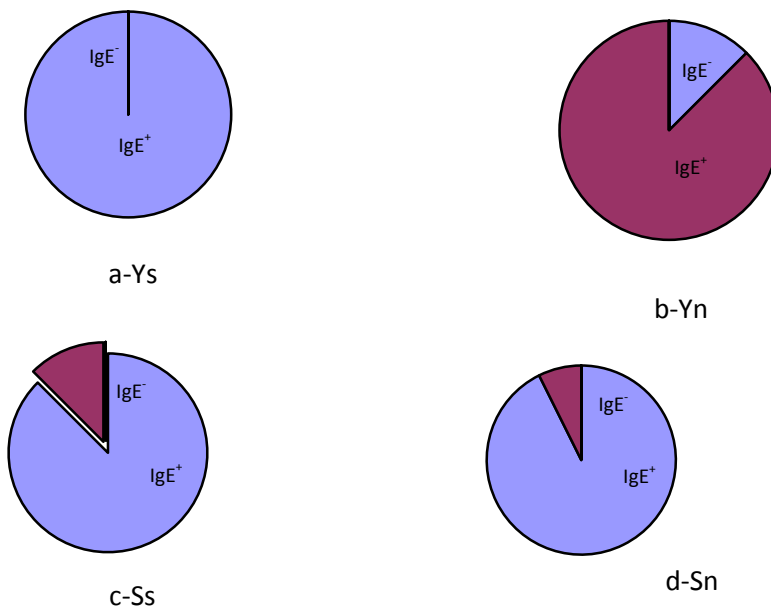
5- Total Globulin

Senescence smoking decrease total globulin levels. The difference between smoker and non smoker senescence were significant at P0.2 using two tailed t statistics .If the ageing does not take n into consideration, that the overall total globulin concentration means were statistically non significant. T_{15+15} 1.2647 and even at P0.2 1.310. (table 1-4)

2.1. Herd Immunity

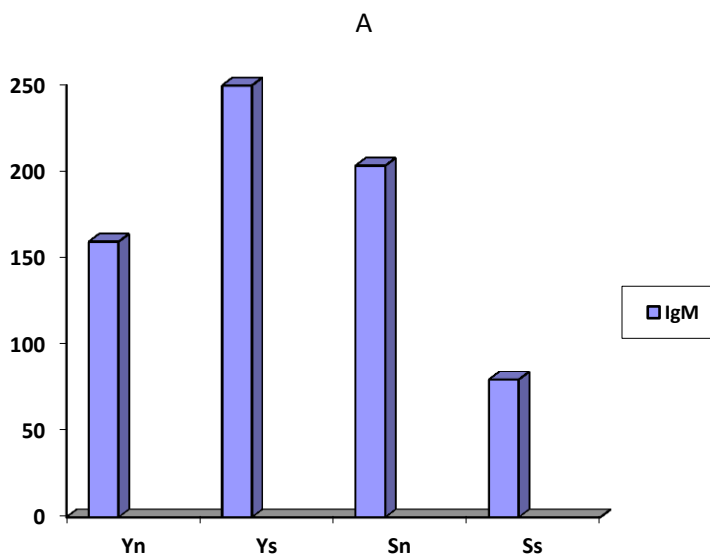
The effects of smoking on the smoker herd (16 subjects) using IgM, IgG and IgA as probes.It was shown smoking effects was different in different Immunoglobulins (Fig 3a -c) .

Figure-1. Pie diagram for IgE response among smokers and nonsmokers



Ys= Young Smoke
 Yn= Young nonsmokers
 Ss= Senescent smoker

Figure-2. Immunoglobulin Igm (A), IgG(B) and IgA (c) concentrations means among smokers and nonsmokers.



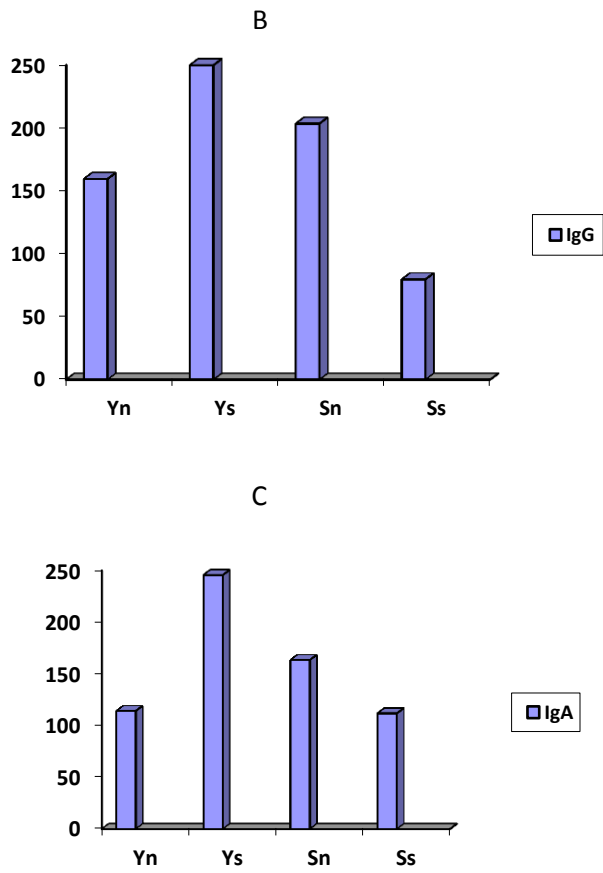
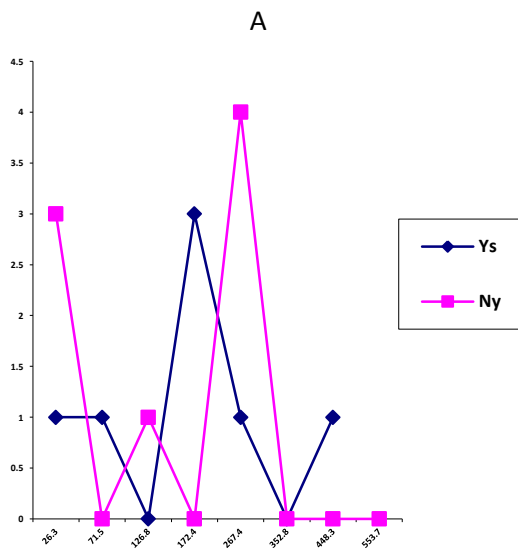
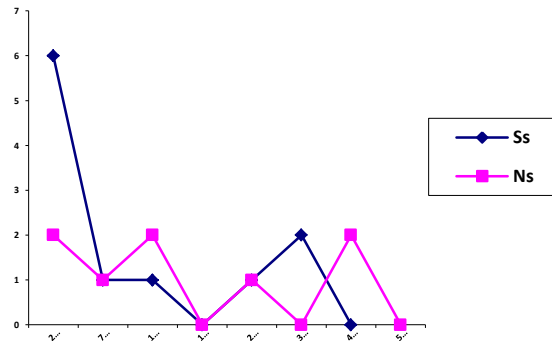


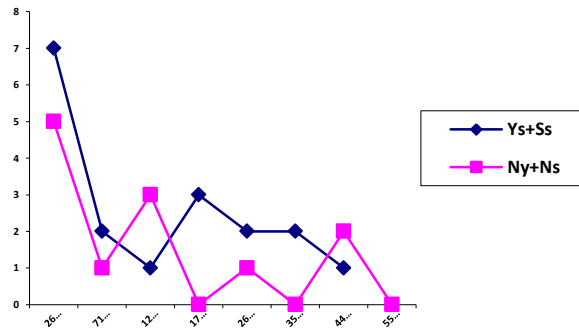
Figure-3. Senescence and Young Concentration as a probe of herd immunity



B



C



3. DISCUSSION

Ageing increases IgM and IgA levels and decreases IgG levels but such increase and decrease doesn't reaches the limits of statistically significant differences (table 1) such debate is not uncommon since ageing inhibits humoral antibody and augument humoral auto anitbody responses [6]. The increase in IgA and IgM levels among non smokers youth as compared to senescence can be explained on the boths of continual low antigen exposure theory of in human ageing [7] .

Smoking decreases; the total globulin concentration , the IgE and increases the IgA concentrations (Table 2) the differences in cases of IgA was statistically significant at P 0.1 .The suppression of total globulin and IgG is parallel to findings of other workers [2, 8].

Smoking as an add up effect to the senesce effect decreases the IgM levels . such decrease was found statistically significant at p 0.2 .It also decreases total globulin .IgG and IgA levels but the differences were non significant statistically (table 3) .These find up finds support with workers both on ageing and smoking effect on the immune system. Smoking among senescent subjects affect suppressive both in total globulin and IgM concentrations .Such suppressive reaches the significants of t statistics to limits of p 0.1 and 0.2 (Table 4). On –comparison to results in table 2

smoking increases IgA among youth subjects .Thus smoking effect in senescence is some what different from smoking effect in youths (Table 2).

Smoking effect increases the rate IgE positive as compared to non smokers both in youths and senescent (Tables 1-4) .Such findings indicated that smoking may induce an immediate hypersensitivity responses among smokers mediated by IgE [9].

When all smokers (16 subjects) and all non smokers (16 subjects) was compared provide removing ageing effect. t statistics for the difference between smokers and non smokers for total globulin , IgM , IgE and IgA but not IgG were non significant .

Though it is a sample study with rather small size study population one can trace the herd immunity effects of smoking using IgM ,IgG & IgA as probes. Graphs showed that smoking affect differently to different immunoglobulins among smokers as compared to non smokers (fig 3) within the limits of the results of this sample study one can put forward the immune features of smoking effects on globulin and immunoglobulins as in the following :

- 1- Smoking induces IgE responses among smokers as compared to non smokers on globulin a Immunoglobulin
- 2- The smoking effects in youths are some what different from smoking effects in senescence.
- 3- Both smoking and ageing might acts together to initiate increase or decrease in globulin and/or Immunoglobulin among the studied subjects
- 4- The smoking effects on herd immunity via IgM ,IgG and IgA as probes have shown to different on different immunoglobulins among individuals forming the herd.

Table-1. The effect of senescence on globulin and immunoglobulin levels

Statistical Factors		Total globulin	IgM	IgG	IgA	IgE
Mean	N _y	77.88	159.41	654.15	114.15	12.5%
	N _s	80.8	203.39	419.20	168.49	37.5%
$ Y_1 - Y_2 $		2.92	43.98	234.95	49.29	25%
SE ²	N _y	16.98	42.44	212.17	38.17	
	N _s	14.66	64.66	102.2	54.92	
SE ²	N _y	281.56	1801.75	45271.51	1565.94	
	N _s	214,98	4180.91	2341.95	3066.20	
$\sqrt{\frac{SE_{N_y}^2}{+} SE_{N_s}^2}$		22.28	77.342	236.04	67.64	
T _{c7+7}		6.1131	0.5686	0.9953	0.7281	
T _{t7+7}						
	0.05	2.145				
	0.1	1.761				
	0.2	1.341				

Table-2. The effect of smoking among youths (25-35Y)old on globulin and immunoglobulin levels

Statistical Factors		Total globulin	IgM	IgG	IgA	IgE
Mean	N	77.88	159.41	654.15	114.15	12.5%
	S	57.45	249.85	633.94	245.60	87.5%
$ N - S $		20.85	90.41	20.21	131.45	875%
SE ²	N	16.78	42.44	212.77	38.13	
	S	4.78	58.08	236.64	55.69	
SE ²	N	281.56	180.15	45271.07	565.94	
	S	22.85	71.93	246.01	64.135	
$\sqrt{SE_n^2 + SE_s^2}$		17.45	91.93	246.01	69.135	
T _{c7+7}		1.1707	1.2569	0.083	1.9057	
T _{t7+7}						
0.05		2.145				
0.1		1.761				
0.2		1.341				

Table-3. The Effect of Senescence and smoking on globulin and immunoglobulin levels

Statistical Factors		Total globulin	IgM	IgG	IgA	IgE
Mean	N _Y	77.8	159.41	654.75	114.15	12.5%
	S _S	58.7	79.67	419.2	111.81	87.5%
$ N_Y - S_s $		19.15	79.74	127.5	72.34	75%
SE ²	N _Y	16.78	42.44	212.77	38.17	
	S _S	56.3	64.68	102.20	30.24	
SE ²	N _Y	281.56	180.15	45271.07	1565.94	
	S _S	214.98	1647.54	24149.16	914.45	
$\sqrt{SE_{NY}^2 + SE_{Ss}^2}$		58.747	58.725	263.417	49.80	
T _{c7+7}		0.3259	1.357	0.9853	0.04469	
T _{t7+7}						
0.05		2.145				
0.1		1.761				
0.2		1.341				

Table-4. The Effect of Smoking on Small total globulin immunoglobulin level

Statistical Factors		Total globulin	IgM	IgG	IgA	IgE
Mean	S _n	86.8	203.39	419.2	163.44	37.5%
	S _s	58.73	79.67	526.88	111.87	87.5%
S _n - S _s		22.07	123.72	107.54	51.57	50.0%
SE ²	S _n	14.66	64.66	102.2	45.92	
	S _s	5.63	40.95	155.4	30.24	
SE ²	S _n	214.915	4180.975	10524.708	2108.64	
	S _s	31.969	1676.905	24149.16	914.45	
$\sqrt{\begin{matrix} SE_{S_n}^2 \\ + \\ SE_{S_s}^2 \end{matrix}}$		15.703	76.536	186.209	54.982	
T _{t7+7}		1.4054	1.6494	0.5777	0.937	
T _{t7+7}						
0.05		2.145				
0.1		1.761				
0.2		1.341				

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