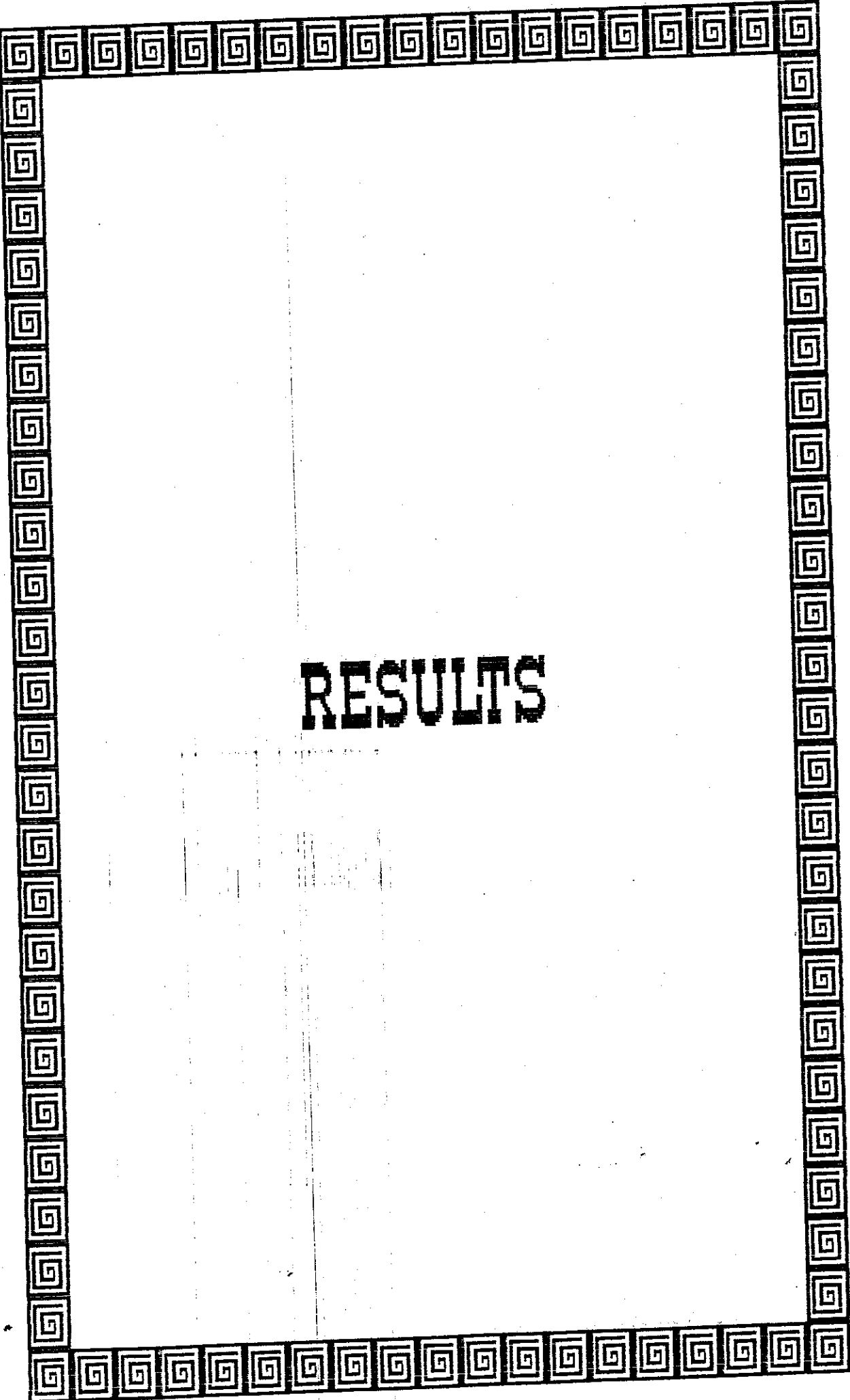




# RESULTS

## RESULTS

The results of this work are illustrated in the following tables :

Table (2): Showed the statistical comparison between the HLA.A antigen frequencies among total patients with rheumatic chorea and general population. Fisher exact test revealed no antigens showing significantly higher frequencies compared to normal population. Also, the contribution of antigens were not significant since the "EF" were low.

Table (3): Showed the statistical comparison between the HLA.A antigen frequencies among patients (G1) with isolated rheumatic chorea and general population. Fisher exact test revealed no antigens showing significantly higher frequencies compared to normal population. Also, the contribution of antigens were not significant since the "EF" were low.

*Table (2)*  
*Statistical comparison of HLA-A. antigen frequencies*  
*among total patients with rheumatic chorea and general population.*

| HLA-A.                      | Antigen frequency |                | Fisher exact<br>(P) | Relative Risk<br>(RR) | Etiologic Fraction<br>(EF) |
|-----------------------------|-------------------|----------------|---------------------|-----------------------|----------------------------|
|                             | Control           | Patient        |                     |                       |                            |
|                             | n = 380           | n = 30 (Total) |                     |                       |                            |
| A <sub>1</sub>              | 20.0              | 26.6           | 0.119               | 1.44                  | 0.0825                     |
| A <sub>2</sub>              | 29.5              | 36.6           | 0.112               | 1.37                  | 0.100                      |
| A <sub>3</sub>              | 8.1               | 13.3           | 0.146               | 1.74                  | 0.056                      |
| A <sub>9</sub>              | 9.2               | 16.6           | 0.096               | 1.96                  | 0.81                       |
| A <sub>10</sub>             | 14.2              | 16.6           | 0.171               | 1.20                  | 0.027                      |
| A <sub>11</sub>             | 12.8              | 16.6           | 0.188               | 1.35                  | 0.043                      |
| A <sub>W<sub>19</sub></sub> | 8.9               | 13.3           | 0.166               | 1.57                  | 0.048                      |
| A <sub>28</sub>             | 8.1               | 10.0           | 0.233               | 1.14                  | 0.020                      |
| A <sub>29</sub>             | 6.3               | 10.0           | 0.191               | 1.50                  | 0.039                      |

*Table (3)*  
*Statistical comparison of HLA-A. antigen frequencies .*  
*among (G1) group and general population.*

| HLA-A.                       | Antigen frequency  |                        | Fisher exact<br>(P) | Relative Risk<br>(RR) | Etiologic Fraction<br>(EF) |
|------------------------------|--------------------|------------------------|---------------------|-----------------------|----------------------------|
|                              | Control<br>n = 380 | Patient (G1)<br>n = 15 |                     |                       |                            |
| A <sub>1</sub>               | 20.0               | 33.3                   | 0.109               | 1.99                  | 0.166                      |
| A <sub>2</sub>               | 29.5               | 33.3                   | 0.209               | 1.19                  | 0.053                      |
| A <sub>3</sub>               | 8.1                | 13.3                   | 0.241               | 1.74                  | 0.056                      |
| A <sub>9</sub>               | 9.2                | 20.0                   | 0.120               | 2.46                  | 0.119                      |
| A <sub>10</sub>              | 14.2               | 13.3                   | 0.295               | 0.926                 | 0.010                      |
| A <sub>11</sub>              | 12.8               | 20.0                   | 0.194               | 1.70                  | 0.082                      |
| A <sub>W</sub> <sub>19</sub> | 8.9                | 13.3                   | 0.257               | 1.57                  | 0.048                      |
| A <sub>28</sub>              | 8.1                | 13.3                   | 0.241               | 1.74                  | 0.056                      |
| A <sub>29</sub>              | 6.3                | 6.6                    | 0.388               | 1.05                  | 0.003                      |

Table (4): Showed the statistical comparison between the HLA.A antigen frequencies among patients "G2" with rheumatic chorea and carditis and general population. Fisher exact test revealed no antigens showing significantly high frequencies compared to normal population. Also, the contribution of antigens are not significant since the "EF" were low.

Table (5): Showed the statistical comparison of HLA.A antigen frequencies among "G1" and "G2" revealed insignificant difference among all antigens since the values were below 3.84 at one degree of freedom and  $P = 0.05$ .

Where : G1 = Patients with isolated chorea.

G2 = Patients with rheumatic chorea and carditis.

*Table (4)*  
*Statistical comparison of HLA-A. antigen frequencies*  
*among (G2) group and general population.*

| HLA-A.                       | Antigen frequency |              | Fisher exact<br>(P) | Relative Risk<br>(RR) | Etiologic Fraction<br>(EF) |
|------------------------------|-------------------|--------------|---------------------|-----------------------|----------------------------|
|                              | Control           | Patient (G2) |                     |                       |                            |
|                              | n = 380           | n = 15       |                     |                       |                            |
| A <sub>1</sub>               | 20.0              | 20.0         | 0.255               | 1.00                  | 0.0                        |
| A <sub>2</sub>               | 29.5              | 40.0         | 0.147               | 1.59                  | 0.148                      |
| A <sub>3</sub>               | 8.1               | 13.3         | 0.241               | 1.74                  | 0.056                      |
| A <sub>9</sub>               | 9.2               | 13.3         | 0.262               | 1.51                  | 0.045                      |
| A <sub>10</sub>              | 14.2              | 20.0         | 0.215               | 1.51                  | 0.067                      |
| A <sub>11</sub>              | 12.8              | 13.3         | 0.296               | 1.04                  | 0.005                      |
| A <sub>W</sub> <sub>19</sub> | 8.9               | 13.3         | 0.257               | 1.57                  | 0.048                      |
| A <sub>28</sub>              | 8.1               | 6.6          | 0.378               | 0.801                 | -0.016                     |
| A <sub>29</sub>              | 6.3               | 13.3         | 0.197               | 2.28                  | 0.074                      |

*Table (5)*  
*Statistical comparison of HLA-A. antigen frequencies*  
*among (G1 and G2) groups of patients.*

| HLA-A.           | G1                |      | G2                |      | Corrected<br>$\chi^2$ | Significance |
|------------------|-------------------|------|-------------------|------|-----------------------|--------------|
|                  | Antigen frequency |      | Antigen frequency |      |                       |              |
|                  | No.               | %    | No.               | %    |                       |              |
| A <sub>1</sub>   | 5                 | 33.3 | 3                 | 20   | 0.170                 | NS           |
| A <sub>2</sub>   | 5                 | 33.3 | 6                 | 40   | 0.574                 | NS           |
| A <sub>3</sub>   | 2                 | 13.3 | 2                 | 13.3 | 0.288                 | NS           |
| A <sub>9</sub>   | 3                 | 20.0 | 2                 | 13.3 | 0.0                   | NS           |
| A <sub>10</sub>  | 2                 | 13.3 | 3                 | 20.0 | 0.96                  | NS           |
| A <sub>11</sub>  | 3                 | 20.0 | 2                 | 13.3 | 0.0                   | NS           |
| AW <sub>19</sub> | 2                 | 13.3 | 2                 | 13.3 | 0.288                 | NS           |
| A <sub>28</sub>  | 2                 | 13.3 | 1                 | 6.6  | 0.0                   | NS           |
| A <sub>29</sub>  | 1                 | 6.6  | 2                 | 13.3 | 1.46                  | NS           |

Table (6): Showed the statistical comparison HLA-B antigen frequencies among total patients and general population. Fisher exact test revealed that B<sub>5</sub> antigen is the only antigen which showed significant higher frequencies compared to normal population. Fisher exact = 0.00003. Also, relative risk revealed that the increase in the risk of B<sub>5</sub> is significant. R.R = 6.111. Also, the contribution of B<sub>5</sub> antigen is significant since the (EF) is high. EF = .473

Table (7): Showed the statistical comparison of HLA-B antigen frequencies among "G1" group of patients (isolated rheumatic chorea) and general population. Fisher exact test revealed no antigens showing significantly higher frequencies compared to normal population. Also, the contribution of antigens are not significant since the "EF" were low.

*Table (6)*  
*Statistical comparison of HLA-B antigen frequencies*  
*among total patient and general population.*

| HLA-B.          | Antigen frequency  |                           | Fisher exact<br>(P) | Relative Risk<br>(RR) | Etiologic Fraction<br>(EF) |
|-----------------|--------------------|---------------------------|---------------------|-----------------------|----------------------------|
|                 | Control<br>n = 380 | Patient (total)<br>n = 30 |                     |                       |                            |
| B <sub>6</sub>  | 17.6               | 56.6                      | 0.00003             | 6.111                 | 0.473                      |
| B <sub>7</sub>  | 6.5                | 6.6                       | 0.291               | 1.016                 | 0.001                      |
| B <sub>8</sub>  | 6.5                | 6.6                       | 0.291               | 1.016                 | 0.001                      |
| B <sub>12</sub> | 20.5               | 23.3                      | 0.166               | 1.178                 | 0.035                      |
| B <sub>13</sub> | 3.1                | 3.3                       | 0.389               | 0.106                 | 0.002                      |
| B <sub>14</sub> | 7.3                | 10.0                      | 0.219               | 1.41                  | 0.029                      |
| B <sub>15</sub> | 5.0                | 3.3                       | 0.350               | 0.648                 | 0.017                      |
| B <sub>16</sub> | 3.1                | 3.3                       | 0.389               | 0.106                 | 0.002                      |
| B <sub>17</sub> | 5.6                | 6.6                       | 0.284               | 1.191                 | 0.010                      |
| B <sub>18</sub> | 5.2                | 10.0                      | 0.154               | 2.025                 | 0.050                      |
| B <sub>21</sub> | 5.5                | 6.6                       | 0.284               | 1.214                 | 0.011                      |
| B <sub>22</sub> | 5.2                | 6.6                       | 0.279               | 1.288                 | 0.014                      |
| B <sub>27</sub> | 4.7                | 6.6                       | 0.273               | 1.433                 | 0.19                       |
| B <sub>37</sub> | 4.2                | 6.6                       | 0.249               | 1.612                 | 0.025                      |
| B <sub>40</sub> | 3.1                | 3.3                       | 0.389               | 0.106                 | 0.002                      |

*Table (7)*  
*Statistical comparison of HLA-B antigen frequencies*  
*among (G1) group of patient and general population.*

| HLA-B.          | Antigen frequency  |              | Fisher exact<br>(P) | Relative Risk<br>(RR) | Etiologic Fraction<br>(EF) |
|-----------------|--------------------|--------------|---------------------|-----------------------|----------------------------|
|                 | Control<br>n = 380 | G1<br>n = 15 |                     |                       |                            |
| B <sub>5</sub>  | 17.6               | 26.6         | 0.163               | 1.69                  | 0.109                      |
| B <sub>7</sub>  | 6.5                | 6.6          | 0.388               | 1.016                 | 0.001                      |
| B <sub>6</sub>  | 6.5                | 6.6          | 0.388               | 1.016                 | 0.001                      |
| B <sub>12</sub> | 20.5               | 20.0         | 0.255               | 0.969                 | -0.006                     |
| B <sub>13</sub> | 3.1                | 6.6          | 0.318               | 2.216                 | 0.036                      |
| B <sub>14</sub> | 7.3                | 13.3         | 0.221               | 1.94                  | 0.064                      |
| B <sub>15</sub> | 5.0                | 6.6          | 0.376               | 1.34                  | 0.016                      |
| B <sub>16</sub> | 3.1                | 6.6          | 0.318               | 2.21                  | 0.036                      |
| B <sub>17</sub> | 5.6                | 13.3         | 0.165               | 2.58                  | 0.081                      |
| B <sub>18</sub> | 5.2                | 13.3         | 0.156               | 2.80                  | 0.085                      |
| B <sub>21</sub> | 5.5                | 6.6          | 0.383               | 1.214                 | 0.011                      |
| B <sub>22</sub> | 5.2                | 6.6          | 0.379               | 1.288                 | 0.014                      |
| B <sub>27</sub> | 4.7                | 6.6          | 0.377               | 1.433                 | 0.019                      |
| B <sub>37</sub> | 4.2                | 6.6          | 0.358               | 1.45                  | 0.018                      |
| B <sub>40</sub> | 3.1                | 0.0          | 0.624               | 0.0                   | 0.0                        |

Table (8): Showed the statistical comparison of HLA-B antigen frequencies among "G2" group of patients (rheumatic chorea with carditis) and general population. Fisher exact test revealed that B<sub>5</sub> antigen is the only antigen that showing significantly higher frequencies compared to normal population. Fisher exact = 0.00001. Also, the relative risk revealed that the increase in the risk of B<sub>5</sub> antigen is significant. R.R=30.36. Also, the contribution of HLA-B<sub>5</sub> antigens are significant since the (EF) were high. EF = 0.833.

Table (9): Showed the statistical comparison of HLA-B antigen frequencies among G1 and G2 groups of patients. The table revealed that insignificant difference among all antigens except B<sub>5</sub> antigen which showed highly significant difference since  $\chi^2_c = 20.83$  and  $P < 0.0001$  at one degree of freedom.

*Table (8)*  
*Statistical comparison of HLA-B antigen frequencies*  
*among (G2) group of patient and general population.*

| HLA-B.          | Antigen frequency  |              | Fisher exact<br>(P) | Relative Risk<br>(RR) | Etiologic Fraction<br>(EF) |
|-----------------|--------------------|--------------|---------------------|-----------------------|----------------------------|
|                 | Control<br>n = 380 | G2<br>n = 15 |                     |                       |                            |
| B <sub>5</sub>  | 17.6               | 86.6         | 0.00001             | 30.36                 | 0.833                      |
| B <sub>7</sub>  | 6.5                | 6.6          | 0.388               | 1.016                 | 0.001                      |
| B <sub>8</sub>  | 6.5                | 6.6          | 0.388               | 1.016                 | 0.001                      |
| B <sub>12</sub> | 20.5               | 6.6          | 0.199               | 0.273                 | 0.174                      |
| B <sub>13</sub> | 3.1                | 0.0          | 0.624               | 0.0                   | 0.0                        |
| B <sub>14</sub> | 7.3                | 6.6          | 0.385               | 0.897                 | 0.007                      |
| B <sub>15</sub> | 5.0                | 0.0          | 0.471               | 0.0                   | 0.0                        |
| B <sub>16</sub> | 3.1                | 0.0          | 0.624               | 0.0                   | 0.0                        |
| B <sub>17</sub> | 5.6                | 0.0          | 0.434               | 0.0                   | 0.0                        |
| B <sub>18</sub> | 5.2                | 6.6          | 0.379               | 1.28                  | 0.014                      |
| B <sub>21</sub> | 5.5                | 6.6          | 0.383               | 1.214                 | 0.011                      |
| B <sub>22</sub> | 5.2                | 6.6          | 0.379               | 1.288                 | 0.014                      |
| B <sub>27</sub> | 4.7                | 6.6          | 0.371               | 1.433                 | 0.019                      |
| B <sub>37</sub> | 4.2                | 6.6          | 0.358               | 1.612                 | 0.025                      |
| B <sub>40</sub> | 3.1                | 6.6          | 0.318               | 2.21                  | 0.025                      |

*Table (9)*  
*Statistical comparison of HLA-B. antigen frequencies*  
*among (G1 and G2) groups of patients.*

| HLA-A.          | G1                       |      | G2                       |      | Corrected<br>$\chi^2$ | Significance |
|-----------------|--------------------------|------|--------------------------|------|-----------------------|--------------|
|                 | Antigen frequency<br>No. | %    | Antigen frequency<br>No. | %    |                       |              |
| B <sub>5</sub>  | 4                        | 26.6 | 13                       | 86.6 | 20.83                 | HS           |
| B <sub>7</sub>  | 1                        | 6.6  | 1                        | 6.6  | 0.535                 | NS           |
| B <sub>8</sub>  | 1                        | 6.6  | 1                        | 6.6  | 0.535                 | NS           |
| B <sub>12</sub> | 3                        | 20.0 | 4                        | 26.6 | 0.745                 | NS           |
| B <sub>13</sub> | 1                        | 6.6  | 0                        | 0.0  | 0.0                   | NS           |
| B <sub>14</sub> | 2                        | 13.3 | 1                        | 6.6  | 0.658                 | NS           |
| B <sub>16</sub> | 1                        | 6.6  | 0.0                      | 0.0  | 0.0                   | NS           |
| B <sub>15</sub> | 1                        | 6.6  | 0.0                      | 0.0  | 0.0                   | NS           |
| B <sub>17</sub> | 2                        | 13.3 | 0.0                      | 0.0  | 0.0                   | NS           |
| B <sub>18</sub> | 2                        | 13.3 | 1.0                      | 6.6  | 0.658                 | NS           |
| B <sub>21</sub> | 1                        | 6.6  | 1                        | 6.6  | 0.535                 | NS           |
| B <sub>22</sub> | 1                        | 6.6  | 1                        | 6.6  | 0.535                 | NS           |
| B <sub>27</sub> | 1                        | 6.6  | 1                        | 6.6  | 0.535                 | NS           |
| B <sub>37</sub> | 1                        | 6.6  | 1                        | 6.6  | 0.535                 | NS           |
| B <sub>40</sub> | 0                        | 0.0  | 1                        | 6.6  | 0.0                   | NS           |

HS = highly significant

NS = not significant

Table (10): Showed the statistical comparison of HLA-DR antigen frequencies among total number of patients and normal general population. Fisher exact test revealed that HLA-DR<sub>2</sub> is the only antigen that showing significantly higher frequencies compared to normal population. Fisher exact = 0.00023. Also, the relative risk revealed that the increase in the risk of DR<sub>2</sub> antigen is significant. R.R = 4.39 Also, the contribution of DR<sub>2</sub> antigens are significant since the "EF" were high. EF = 0.411.

Table (11): Showed the statistical comparison of HLA-DR antigen frequencies among "G1" group of patients (isolated rheumatic chorea) and general population. Fisher exact test revealed that DR<sub>2</sub> antigen is the only antigen showing significantly higher frequencies compared to the normal population. Fisher exact = 0.00005. Also, the relative risk revealed that the increase in the risk of DR<sub>2</sub> antigen is significant. R.R=15.41. Also, the contribution of Dr<sub>2</sub> antigens are significant since the "EF" were high. EF = 0.748.

**TABLE (10)**  
*Statistical comparison of HLA-DR antigen Frequencies among  
total number of patients and normal general population.*

| HLA-DR          | Antigen Frequency |                  | Fisher exact<br>(P) | Relative Risk<br>(RR) | Etiologic Fraction<br>"EF" |
|-----------------|-------------------|------------------|---------------------|-----------------------|----------------------------|
|                 | control           | patients (total) |                     |                       |                            |
|                 | n=194             | n= 30            |                     |                       |                            |
| DR <sub>1</sub> | 9.2               | 16.6             | 0.108               | 1.96                  | 0.081                      |
| DR <sub>2</sub> | 20.6              | 53.3             | 0.00023             | 4.39                  | 0.411                      |
| DR <sub>3</sub> | 14.9              | 16.6             | 0.201               | 1.13                  | 0.019                      |
| DR <sub>4</sub> | 15.9              | 20.0             | 0.168               | 1.32                  | 0.048                      |
| DR <sub>5</sub> | 6.1               | 6.6              | 0.300               | 1.08                  | 0.034                      |
| DR <sub>6</sub> | 9.7               | 6.6              | 0.259               | 0.654                 | 0.005                      |

**TABLE (11)**  
*Statistical comparison of HLA-DR antigen Frequencies among (G1)  
of patients and general population.*

| HLA-DR          | Antigen Frequency |      | Fisher exact<br>"p" | Relative Risk<br>"RR" | Etiologic fraction<br>"EF" |
|-----------------|-------------------|------|---------------------|-----------------------|----------------------------|
|                 | control           | G1   |                     |                       |                            |
|                 | n=194             | n=15 |                     |                       |                            |
| DR <sub>1</sub> | 9.2               | 20.0 | 0.129               | 2.46                  | 0.118                      |
| DR <sub>2</sub> | 20.6              | 80.0 | 0.00005             | 15.41                 | 0.748                      |
| DR <sub>3</sub> | 14.9              | 13.3 | 0.296               | 0.876                 | 0.018                      |
| DR <sub>4</sub> | 15.9              | 20.0 | 0.241               | 1.32                  | 0.048                      |
| DR <sub>5</sub> | 6.1               | 6.6  | 0.395               | 1.08                  | 0.005                      |
| DR <sub>7</sub> | 9.7               | 6.6  | 0.359               | 0.657                 | 0.034                      |

Table (12): Showed the statistical comparison of HLA-DR antigen frequencies among "G2" group of patients (chorea with carditis) and general population. Fisher exact test revealed no antigens showing significantly higher frequencies compared to normal population. Also, the contribution of antigens are not significant since the "EF" were low

Table (13): Showed the statistical comparison of HLA-DR antigen frequencies among "G1" and "G2" groups. The table revealed insignificant difference among all antigens except DR<sub>2</sub> antigen which shows highly significant difference since  $\chi^2_c = 6.56$  and  $P < 0.05$ .

*TABLE (12)*  
*Statistical comparison of HLA-DR antigen Frequencies among (G2)*  
*of patients and general population.*

| HLA-DR          | Antigen Frequency |        | Fisher exact<br>"p" | Relative Risk<br>"RR" | Etiologic Fraction<br>"EF" |
|-----------------|-------------------|--------|---------------------|-----------------------|----------------------------|
|                 | control           | G2     |                     |                       |                            |
|                 | n=195             | n = 15 |                     |                       |                            |
| DR <sub>1</sub> | 9.2               | 13.3   | 0.270               | 1.51                  | 0.045                      |
| DR <sub>2</sub> | 20.6              | 26.6   | 0.205               | 1.39                  | 0.075                      |
| DR <sub>3</sub> | 14.9              | 20.0   | 0.229               | 1.42                  | 0.059                      |
| DR <sub>4</sub> | 15.9              | 20.0   | 0.241               | 1.32                  | 0.048                      |
| DR <sub>5</sub> | 6.1               | 6.6    | 0.395               | 1.08                  | 0.005                      |
| DR <sub>7</sub> | 9.7               | 6.6    | 0.359               | 0.675                 | 0.034                      |

**TABLE (13)**  
*Statistical comparison of HLA-DR antigen Frequencies among (G1) and (G2) groups of patients.*

| HLA-DR          | G1                |      | G2                |      | Corrected X <sup>2</sup> | Significance |
|-----------------|-------------------|------|-------------------|------|--------------------------|--------------|
|                 | Antigen Frequency |      | Antigen Frequency |      |                          |              |
|                 | NO                | %    | NO                | %    |                          |              |
| DR <sub>1</sub> | 3                 | 20.0 | 2                 | 13.3 | 0.0042                   | NS           |
| DR <sub>2</sub> | 12                | 80.0 | 4                 | 26.6 | 6.565                    | HS           |
| DR <sub>3</sub> | 2                 | 13.3 | 3                 | 20.0 | 0.96                     | NS           |
| DR <sub>4</sub> | 3                 | 20.0 | 3                 | 20.0 | 0.20                     | NS           |
| DR <sub>5</sub> | 1                 | 6.6  | 1                 | 6.6  | 0.535                    | NS           |
| DR <sub>7</sub> | 1                 | 6.6  | 1                 | 6.6  | 0.535                    | NS           |

NS = Not Significant

HS = Highly Significant.

TABLE (14)  
The significance of relative risks in all patients and  
(G1) and (G2) groups .

| HLA-antigens                |                        | 1/h   | 1/k   | 1/H   | 1/K   | Y     | W    | WY <sup>2</sup> | P       |
|-----------------------------|------------------------|-------|-------|-------|-------|-------|------|-----------------|---------|
| All patients                |                        |       |       |       |       |       |      |                 |         |
| B5                          |                        | 0.058 | 0.078 | 0.014 | 0.003 | 1.809 | 6.62 | 21.6            | <0.0001 |
|                             | DR2                    | 0.062 | 0.071 | 0.025 | 0.006 | 1.479 | 6.09 | 13.3            | <0.001  |
|                             | (G1) (isolated chorea) | 0.083 | 0.333 | 0.025 | 0.006 | 2.735 | 2.23 | 16.6            | <0.0001 |
| DR2                         |                        |       |       |       |       |       |      |                 |         |
| (G2) (chorea with carditis) |                        |       |       |       |       |       |      |                 |         |
| B5                          |                        | 0.076 | 0.500 | 0.014 | 0.003 | 3.413 | 1.68 | 19.5            | <0.0001 |
|                             |                        |       |       |       |       |       |      |                 |         |

*h* = number of patients having the antigen.  
*k* = number of patients lacking the antigen.  
*H* = number of controls having the antigen.  
*K* = number of controls lacking the antigen.  
*Y* = loge RR.

1

$$W = \frac{1}{1/h + 1/k + 1/H + 1/K}$$