Quantitative dermatoglyphic analysis of digitopalmar ridge count was used to research psoriatic symmetrical polyarthritis in fifty women. Analyzed were 25 dermatoglyphics traits: number of epidermal ridges on all ten fingers, their sum for five and ten fingers, four traits on both palms, i.e. between a-b, b-c, c-d and a-d triradii, and atd angles and their bilateral sum. The data obtained were compared with those recorded in a control group of 200 pairs of imprints of phenotypically healthy females from Zagreb area. Statistically significant differences were found in 13 variables in decreased ridge count in all ten fingers, their sum in five and ten fingers separately. Accordingly, a polygenetic system identical in some loci to polygenic system predisposing to women psoriatic symmetrical polyarthritis susceptibility might be found responsible for the dermatoglyphic pattern development.

Key words
dermatoglyphics, quantitative analysis, polyarthritic symmetrical psoriatic arthritis, female gender

Introduction
Psoriatic arthritis (PsA) is a complex genetic disorder that results from an interplay between multiple genetic and environmental factors. Although the exact pathogenesis of PsA is unclear, there is a substantial contribu-
tion of genetic factors to the etiology of PsA (1). Dafna Gladman and Vinod Chandran in their book “The facts - Psoriatic arthritis” wrote about Human leukocyte antigen (HLA) genes: HLA genes on chromosome 6 were found to be associated with PsA more than 30 years ago. HLA genes are classified into class I and class II. HLA A, B and C belong to class I, whereas HLA DP, DQ and DR belong to class II. Antigens produced by HLA class I genes are present on almost all cells of the body, whereas those produced by HLA class II genes are present mainly on immune cells. Class I antigens, HLA-B13, HLA-B57, HLA-B39, HLA-Cw6 and HLA-Cw7, were shown to be associated with psoriasis and PsA by many researchers worldwide. The strongest association is with HLA-Cw6. HLA class I antigens has also been shown with various types of PsA. HLA-B27 is associated with back disease, and HLA-B38 and HLA-B39 with peripheral arthritis. There are another two genes that have been shown to lie close to HLA genes and are associated with PsA, TNF-alpha and MICA genes. It is likely that environmental factors trigger the illness in a genetically susceptible individual. However, no single agent has been clearly identified. Physical trauma is one such environmental factor. Viral infections may also trigger PsA. Recently, rubella vaccination, injury sufficient to require a medical consultation, bone fractures, and house moving were found to be associated with onset of PsA (2).

Achievements of dermatoglyphic research until today show their value as valid method in biomedical and clinical research. It is certain that the increasing knowledge of mechanisms of their inheritance contributed to that. Dermatoglyphics indirectly point at the influence of polygenic factors of inheritance, the near structures (palms and soles) the same as the distant ones (for example, CNS, and others to) (3). The basic principle of this kind of research is that there is some genetic mechanism between 13th and 25th week of intrauterine development which, at the same time, has an impact to predisposition to psoriatic arthritis and the change of dermatoglyphics drawing. Dermatoglyphic traits are inherited by polygenetic effect but without domination of one of the involving genes.

This is the first paper on dermatoglyphics and psoriatic arthritis, except our conference reports (4-12).

Material and methods

Dermograms of fifty female Psoriatic symmetrical polyarthritis were analyzed according to Classification of psoriatic arthritis (CASPAR) criteria (13), and in keeping with instructions provided by Miličić et al. (14). Results were compared with 200 dermatograms of phenotypically normal women from the Zagreb area, obtained from the Institute of Anthropology in Zagreb (15).

Twenty five variables, abbreviated and designated as follows, were examined by the quantitative analysis: 1. FRD1 ridge count on the first finger of the right hand; 2. FRD2 ridge count on the second finger of the right hand; 3. FRD3 ridge count on the third finger of the right hand; 4. FRD4 ridge count on the fourth finger of the right hand; 5. FRD5 ridge count on the fifth finger of the right hand; 6. TFRCD total ridge count on all five fingers of the right hand; 7. a-b rcD ridge count between a-b triradii of the right hand; 8. b-c rcD ridge count between b-c triradii of the right hand; 9. c-d rcD ridge count between c-d triradii of the right hand; 10. a-d rcD ridge count between a-d triradii of the right hand; 11. atd D atd angle on the right palm; 12. FRL1 ridge count on the first finger of the left hand; 13. FRL2 ridge count on the second finger of the left hand; 14. FRL3 ridge count on the third finger of the left hand; 15. FRL4 ridge count on the fourth finger of the left hand; 16. FRL5 ridge count on te fifth finger of the left hand; 17. TFRCL total ridge count on all five fingers of the left hand; 18. a-b rcL ridge count between a-b triradii of the left hand; 19. b-c rcL ridge count between b-c triradii of the left hand; 20. c-d rcL ridge count between c-d triradii of the left hand; 21. a-c rcL ridge count between a-d triradii of the left hand; 22. atd L atd angle on the left palm; 23. TFRCL total ridge count on all ten fingers; 24. TPRC bilateral ridge count between all triradii of the palms; 25. ATDD DL bilateral sum of palmar atd angle (in degrees).

Student’s t-test was used to test statistically significant differences in the ridge count between the patients and the control group.

Results

Results are presented in tables 1-3.

Ridge count on the first, second, third, fourth, fifth finger and on all five fingers of the right hand was significantly lower in female psoriatic patients compared with controls.

Ridge count on the first, second, third, fourth, fifth finger and all five fingers of the left hand was significantly lower in female psoriatic patients compared with controls.

Ridge count on all ten fingers was significantly lower in female psoriatic patients compared with controls.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patient group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFRC</td>
<td>n x SD</td>
<td>n x SD</td>
</tr>
<tr>
<td>50</td>
<td>79.06 *30.28</td>
<td>200 133.30 42.57</td>
</tr>
<tr>
<td>TPRC</td>
<td>50 215.28 22.40</td>
<td>200 211.80 24.46</td>
</tr>
<tr>
<td>ATDDL</td>
<td>50 90.58 16.85</td>
<td>200 94.56 15.88</td>
</tr>
</tbody>
</table>

*Statistically significant difference from controls
Table 2. Quantitative properties of right hand digitopalmar dermatoglyphics in patients and control subjects

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patient group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n x SD</td>
<td>n x SD</td>
</tr>
<tr>
<td>FRD1</td>
<td>50 13.6 *6.14</td>
<td>200 17.23 5.56</td>
</tr>
<tr>
<td>FRD2</td>
<td>50 3.94 *4.07</td>
<td>200 11.62 6.55</td>
</tr>
<tr>
<td>FRD3</td>
<td>50 6.32 *5.48</td>
<td>200 11.44 5.31</td>
</tr>
<tr>
<td>FRD4</td>
<td>50 10.86 *6.09</td>
<td>200 15.78 5.72</td>
</tr>
<tr>
<td>FRD5</td>
<td>50 9.20 *5.17</td>
<td>200 12.70 4.83</td>
</tr>
<tr>
<td>TFRCD</td>
<td>50 43.38 *16.05</td>
<td>200 68.77 21.65</td>
</tr>
<tr>
<td>a-b rcD</td>
<td>50 42.46 4.91</td>
<td>200 41.03 6.02</td>
</tr>
<tr>
<td>b-c rcD</td>
<td>50 28.64 5.86</td>
<td>200 27.31 6.00</td>
</tr>
<tr>
<td>c-d rcD</td>
<td>50 37.22 5.35</td>
<td>200 36.70 6.43</td>
</tr>
<tr>
<td>a-d rcD</td>
<td>50 108.32 11.47</td>
<td>200 105.05 12.68</td>
</tr>
<tr>
<td>atd D</td>
<td>50 45.36 9.26</td>
<td>200 46.87 8.67</td>
</tr>
</tbody>
</table>

*Statistically significant difference from controls

Discussion

As we mentioned before, according to our best knowledge, this is the first paper dealing with psoriatic arthritis and dermatoglyphics. Because of that we could not make any comparison or discussion on this topic to the others. However, by the poster presentation on the 2nd World Psoriasis and Psoriatic Arthritis Conference in Sweden this year, we have presented four hundred psoriasis and psoriatic patients from Croatia (140 psoriatic and 260 with psoriatic arthritis) in quantitative analysis of dermatoglyphics.

We have found statistically significant differences between psoriasis and psoriatic arthritis patients from the one side, and among the five clinical subgroups (according to Moll and Wright, classical, mutilans, polyarticular, oligoarticular and spondylitis group (16)) in psoriatic patients from the other side. Statistically significant differences between psoriatic male patients to control were found in 14 variables, and female psoriatic patients to control in 6 variables; in psoriatic arthritis male patients to control in 9 variables and female psoriatic arthritis patients to control in 9 variables; between male psoriatic and male psoriatic arthritis patients in 12 variables, and between female psoriatic and female psoriatic arthritis patients in 13 variables. Furthermore, statistically significant differences were found in 67 variables among male psoriatic arthritis patients to control, and among female psoriatic arthritis patients in 69 variables to control. Lastly, statistically significant differences were found among five clinical subgroups of male psoriatic patients in 122 variables and among five clinical subgroups in female patients in 130 variables.

Additionally, we have found statistically significant differences between female symmetrical psoriatic polyarthritis and female rheumatoid arthritis patients in nine variables: on third, fourth and fifth fingers on both hands, on five fingers of both hands separately, and on all ten fingers in psoriatic arthritis patients (17). Statistically significant differences between symmetrical psoriatic arthritis males to rheumatoid arthritis male patients were found in 16 variables: on the first, second, third, fourth, fifth, then on all five fingers of the right hand, and between triradii a-d rcD and ATDD angle (in degrees) on the right hand to, on the first, second, fourth, fifth and on the all five fingers and ATDL angle (in degrees) on the left hand, and on all ten fingers and ATDL angles (in degrees of both hands) (18).

Statistically significant differences were found between psoriatic spondylitis and ankylosing spondylitis in seven variables to: on both second finger, fourth finger right fifth finger both, atd angle on the right palm and between triradii b-c on the left palm (8).

Lastly, statistically significant differences were found between psoriatic spondylitis and Riter’s disease in 14 variables: on the first, second, third, fourth and fifth finger right, than on the first, second, third and fifth finger left, in total ridge count on five fingers of each hand, atd angle on the left palm, atd angles on both hands together, and in total sum of ridge count on the ten fingers of both hands (9).

Conclusion

In conclusion, we could say that dermatoglyphics came to existence as an important tool for genetics in psoriasis ant psoriatic arthritis, and in their differential diagnostics. Additionally, we have found differen-
tial diagnostics between psoriatic arthritis and rheumatoid arthritis in male and female patients, between psoriatic and ankylosing spondylitis, and between psoriatic spondylitis and Riter’s disease.

**Literature**


