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QUANTITATIVE ANALYSIS OF DIGITOPALMAR DERMATOGLYPHICS IN FIFTY MALE PSORIATIC SPONDYLITIS PATIENTS

KVANTITATIVNA ANALIZA DIGITOPALMARNIH DERMATOGLIFA U PEDESETORICE BOLESNIKA S PSORIJATIČNIM SPONDILITISOM

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"Jehovah... his own flesh... will keep aching" Job 14:22, NW.

Summary

By the quantitative dermatoglyphic analysis of digitopalmar ridge count in fifty male psoriatic spondylitis patients were researched 25 dermatoglyphics traits: number of epidermal ridges on the all ten fingers, their sum for five and ten fingers, four traits on the both palms, i.e. between a-b, b-c, c-d and a-d triradii, and atd angles and their bilateral sum in degrees. The data obtained were compared with those recorded in a control group of 200 pairs of imprints of phenotypically healthy males from the Zagreb area. Statistically significant differences to control

were found in 13 variables in decreased ridge count in second, third, fourth and fifth finger on the right palm, and in their sum on the all five fingers, than in second, third, fourth and fifth finger on the left palm, and in their sum in the all fingers, and in the all ten fingers. Atd angle was decreased on the left palm, and on the both palm together. Accordingly a polygenetic system identical in some loci to polygenetic system predisposing to male psoriatic spondylitis susceptibility might be found responsible for dermatoglyphic pattern development.

Keywords

dermatoglyphics, quantitative analysis, psoriatic spondylitis, male gender

Sažetak

U radu se kvantitativnom analizom digitopalmarnih dermatoglifa istražio broj grebenova u pedeset muškaraca s psorijatičnim spondilitisom. Analizirano je 25 varijabli, broj grebenova na svih deset prstiju šaka, zatim, sveukupno na pet i deset prstiju, te između triradijusa a-b, b-c, c-d i a-d na oba dlana, te njihov ukupan broj na jednom i oba dlana, te atd kutovi na oba dlana i njihov ukupni broj u stupnjevima. Dobiveni podaci su uspoređeni s kontrolnom skupinom od 200 pari otisaka odraslih i fenotipski zdravih muškaraca Zagrebačke regije. Statistički značaj-

ne razlike prema kontroli nađene su u 13 varijabli u smislu smanjenja broja kožnih grebenova na drugom, trećem, četvrtom i petom prstu desne ruke, te sveukupnom zbroju prstiju desne ruke, zatim, na drugom, trećem, četvrtom i petom prstu lijeve ruke, sveukupnom zbroju prstiju lijeve ruke, te obostranom zbroju svih deset prstiju. Smanjen atd kut bio je na lijevom dlanu te njegovu obostranom zbroju na dlanovima. Iz toga se daje zaključiti kako je poligenski sustav u razvoju dermatoglifa identičan s nekim lokusima za razvoj psorijatičnog spondilitisa u muškaraca.

Ključne riječi

dermatoglifi, kvantitativna analiza, psorijatični spondilitis, muški spol

Introduction

Psoriatic arthritis (PsA) is an inflammatory arthritis associated with psoriasis. The arthritis presents with

tender and swollen joints, and in about half the patients there is involvement of the spine, with pain, stiffness, and

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limitation of movement (1). Psoriatic spondylitis has emerged as a clinical concept, it seems for the first time by Zellner (1928), when he has mentioned a connection between spondylitis and psoriasis (2), and after him Bauer and Vogl (1931) (3). Coste and Forestier have described the manifestations on the spine as a special form of PsA (1935) (4). Fletscher and Rose (1955), have introduced a term psoriatic spondylitis, because they wanted to emphasize characteristic changes on the spine in psoriasis (5). In Croatia Jajić and Križ, (1966), in their Case report have described psoriatic spondylitis male patient (6). In the next his paper, Jajić (1968) has described radiological characteristics of the spine and sacroiliacal joints, and he commented: "In view of the frequency of sacro-iliac and spinal changes, we think that a chance association between psoriasis and ankylosing spondylitis can be excluded, and we suggest that they represent a separate entity for which the title spondylitis psoriatica is proposed" (7).

Material and methods

Dermograms of fifty male Psoriatic spondylitis patients were analysed according to Classification of Psoriatic arthritis (CASPAR) criteria (18), and keeping with instructions provided by Miličić et al. (19). Results were compared with 200 dermograms phenotypically normal men from the Zagreb area, obtained from the Institute of Anthropology in Zagreb (17). Palmar prints were taken of use of finely granulated silver-gray powder onto transparent adhesive tape (18).

Twenty-five variables, abbreviated and designated as follows, were examined by the quantitative dermatoglyphic 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. **TFRC** 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

By the family studies, genetic linkage studies and genetic association studies it is possible to conclude that genetic factors are indeed important in a disease (1/page 26-28). That is why by one of the genetic method, quantitative analysis of digitopalmar dermatoglyphics we have made research in fifty male psoriatic spondylitis patients. In 13 variables out of 25, we have found the statistically significant differences to controls.

According to our best knowledge, this is a second paper dealing with PsA, namely psoriatic spondylitis, and dermatoglyphics. The first is our (8), and there are some of our conference reports (9-14).

Dermatoglyphic analysis should be strictly separated according to sex, because of the great impact of sex chromosomes and sex hormones on the dermatoglyphic traits (15,16). Even significant differences according to sex have been found within control groups (17).

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 hand; 12. **FRL1** ridge count on the first finger on the left hand; 13. **FRL2** ridge count on the second finger on the left hand; 14. **FRL3** ridge count on the third finger on the left hand; 15. **FRL4** ridge count on the fourth finger on the left hand; 16. **FRL5** ridge count on the fifth finger on the left hand; 17. **TFRC** 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-d rcL** ridge count between a-d triradii of the left hand; 22. **atd L** atd angle on the left hand; 23. **TFRC** total ridge count on all ten fingers; 24. **TPRC** bilateral ridge count between all triradii of the palms; 25. **ATDDL** 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 control group.

Results

Results are tabularly presented in tables 1-3. Ridge count on the all ten fingers was significantly decreased in male psoriatic patient to control. Atd angle was lower on the both palm together to controls. Ridge count on the second, third, fourth and fifth finger and in their sum on the all of five fingers of the right hand was significantly decreased in male psoriatic spondylitis patient to controls. Ridge count on the second, third, fourth and fifth finger and in their sum on the all of five fingers of the left hand was significantly decreased in male psoriatic spondylitis patient to controls. Atd angle was lower on the left hand to controls.

Table 1. Quantitative traits of digitopalmar complex on both hands in patients and control subjects
 Tablica 1. Rezultati analize kvantitativnih svojstava digitopalmarnog kompleksa u bolesnika i kontrole na obje ruke

| Variable | Patient group n = 50 | | Control group n = 200 | |
|----------|-------------------------|-------|--------------------------|--------|
| | x | SD | x | SD |
| TFRC | 109.98 | 36.00 | 141.03 | 47.44* |
| TPRC | 217.68 | 25.38 | 217.94 | 27.19 |
| ATDDL | 90.30 | 15.49 | 95.28 | 14.30* |

*Statistically significant difference from controls

Table 2. Quantitative traits of right hand digitopalmar dermatoglyphics in patients and controls

Tablica 2. Rezultati analize kvantitativnih svojstava digitopalmarnog kompleksa u bolesnika i kontrole na desnoj ruci

| Variable | Patient group n = 50 | | Control group n = 200 | |
|----------|-------------------------|-------|--------------------------|--------|
| | x | SD | x | SD |
| FRD1 | 17.92 | 6.06 | 19.38 | 5.64 |
| FRD2 | 6.82 | 5.37 | 11.42 | 7.27* |
| FRD3 | 8.98 | 5.14 | 11.99 | 6.58* |
| FRD4 | 13.08 | 5.96 | 16.16 | 6.15* |
| FRD5 | 10.68 | 4.25 | 13.64 | 5.16* |
| TFRC D | 57.48 | 17.14 | 72.57 | 24.65* |
| a-b rcD | 42.68 | 5.43 | 41.85 | 6.86 |
| b-c rcD | 28.92 | 6.09 | 28.58 | 5.87 |
| c-d rcD | 38.86 | 4.59 | 37.94 | 6.07 |
| a-d rcD | 110.46 | 11.71 | 108.47 | 13.39 |
| atd D | 45.02 | 7.54 | 47.43 | 8.27 |

*Statistically significant difference from controls

Table 3. Quantitative traits of left hand digitopalmar dermatoglyphics in patients and controls

Tablica 3. Rezultati analize kvantitativnih svojstava digitopalmarnog kompleksa u bolesnika i kontrole na lijevoj ruci

| Variable | Patient group n = 50 | | Control group n = 200 | |
|----------|-------------------------|-------|--------------------------|--------|
| | x | SD | x | SD |
| FRL1 | 14.72 | 6.06 | 16.20 | 6.14 |
| FRL2 | 5.90 | 4.67 | 10.76 | 6.78* |
| FRL3 | 8.34 | 5.92 | 11.78 | 6.37* |
| FRL4 | 13.00 | 7.03 | 16.25 | 6.17* |
| FRL5 | 10.54 | 4.53 | 13.50 | 4.60* |
| TFRC L | 52.50 | 20.05 | 141.03 | 47.44* |
| a-b rcL | 42.94 | 5.74 | 43.58 | 7.05 |
| b-c rcL | 28.60 | 6.69 | 28.71 | 5.85 |
| c-d rcL | 35.68 | 6.01 | 36.30 | 7.00 |
| a-d rcL | 107.22 | 14.21 | 109.02 | 14.79 |
| atd L | 45.28 | 9.13 | 47.86 | 7.70* |

*Statistically significant difference from controls

Discussion

As we mentioned before, according to our best knowledge, this is the second paper dealing with psoriatic arthritis, namely psoriatic spondylitis in dermatoglyphics and the first is our too (8). That is why we could not make any comparison or discussion on this topic to others. All we could do is comparison to dermatoglyphic research in ankylosing spondylitis and Reiter's disease. Statistically significant differences were found between psoriatic spondylitis and ankylosing spondylitis in the seven variables: on both second finger, fourth finger right, fifth finger both, atd angle on the right palm and between radii b-c on the left palm (19). Statistically significant differences between psoriatic spondylitis and

Reiter's disease were found in 14 variables: on the first, second, third, fourth and fifth finger right, than on 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 (20). We would like to finish discussion by previously mentioned Jajić comment from 1968: "In the view of the frequency of sacro-iliac and spinal changes, we think that a chance association between psoriasis and ankylosing spondylitis can be excluded, and we suggest that they represent a separate entity for which the title spondylitis psoriatica is proposed" (7).

Conclusion

In conclusion, we could say that dermatoglyphics came into existence as an important tool for genetics in psoriasis and psoriatic arthritis, namely psoriatic spondylitis and their differential diagnostics.

This type of research, by dermatoglyphics and their quantitative analysis, which we presented in this paper, is the real contribution to clinical entity of psoriatic spondylitis.

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