

Original Research Article

A Qualitative Analysis Of Dermatoglyphic Patterns In Schizophrenic Patients: A Comparative Study.

Dr. Shivani¹, Dr. Prenika Shangloo², Dr. Nusrat Jabeen³, Dr. Bonita Gupte*⁴.

¹Senior Resident, Post-Graduate Department of Anatomy, Govt. Medical College, Jammu, University of Jammu.(ORCID id: 0000-0002-1980-0118)(MBBS,M.D.)

²Senior Resident, Post- Graduate Department of Anatomy, Govt. Medical College, Jammu, University of Jammu,(ORCID id: 0000-0001-8890-9603)(MBBS, M.D.)

³Professor, Post- Graduate Department of Anatomy, Govt. Medical College, Jammu, University of Jammu(ORCID id: 0000-0002-9005-0428)(MBBS, M.D.)

⁴Senior Resident, Post- Graduate Department of Anatomy, Govt. Medical College, Jammu, University of Jammu,(ORCID id: 0000-0003-0965-4548)(MBBS, M.D.)

***Corresponding Author:-** Dr. Bonita Gupte

*Senior Resident, Post-Graduate Department of Anatomy, Govt. Medical College, Jammu, University of Jammu.(ORCID id: 0000-0003-0965-4548)(MBBS,M.D.)

ABSTRACT:

Background: Dermatoglyphics being a simple and inexpensive method, can be used a diagnostic aid for finding out the predisposed individuals in various genetic disorders associated with chromosomal aberrations and various inheritable diseases like diabetes, hypertension, psychiatric disorders and many more. Henceforth, the current study was planned to delineate the relationship of dermatoglyphics and clinical presentation of patients of schizophrenia.

Methods: This observational study was carried out in Postgraduate Department of Anatomy, Government Medical College, Jammu and in the OPD block of Department of Psychiatry, Associated Hospital of Government Medical College, Jammu. A total of 200 subjects were taken for the study. Out of 200 subjects 100 were cases i.e. Schizophrenia patients (Group S) and 100 were Controls (Group C).

Results: The frequency of arches in both right and left hands were decreased in schizophrenia patients as compared to controls. Ulnar loop pattern in both right and left hands were lower in schizophrenia patients when compared to controls. Radial loops were seen more in schizophrenia patients when compared to controls. In the present study, the pattern of whorls in both right and left hands were higher in schizophrenia patients when compared to controls.

Conclusion: The results of present study concluded that variations do exist in the dermatoglyphic patterns in patients of Schizophrenia. While taking the clinical features into consideration, it was inferred that the use of dermatoglyphics can be used as a reliable genetic marker for screening high risk people for the early detection in Schizophrenia.

INTRODUCTION

Since the early days of civilization, the features of the hands have fascinated scholars, doctors, and laymen alike. Through decades of scientific research, the hand has come to be recognized as a

powerful tool in the diagnosis of psychological, medical and genetic conditions. Cummins and Midlo in 1926 first introduced the term “dermatoglyphics” which refers to the study of naturally occurring patterns of the surface of the hands and feet.^[1] Since then, this approach has been used in various scientific studies to establish relationship of fingerprints as genetic markers.

Dermatoglyphics has at least 3 major advantages in the diagnosis of medical disorders:

- The epidermal ridge patterns on the palms and soles are fully developed at birth and thereafter remain unchanged for life.
- Scanning of the dermatoglyphic patterns or recording these patterns can be accomplished rapidly and without giving trauma to the patient.
- Dermatoglyphics investigation is absolutely cost effective and requires no hospitalization with use of minimal equipments.^[2]

Therefore, diagnosis of Diabetes Mellitus, Schizophrenia, hypertension, etc. can now be aided by dermatoglyphic analysis.^[3]

The morphology of the epidermal ridge is genetically determined. Dermatoglyphic patterns begin to develop in the 10th week of gestation and are completed by 24th week .^[4] This time of intrauterine life coincides with the critical phase of brain development. Both the epidermal ridges and brain have a common origin from the ectodermal germ layer. So, there may be some biological and clinical values associated with the origin of brain and skin ridge patterns.

Schizophrenia is a mental disorder characterized by abnormal social behavior and failure to understand what is real. Common symptoms include false beliefs, unclear or confused thinking, hearing voices that others do not, reduced social engagement and emotional expression, and a lack of motivation. People with schizophrenia often have additional mental health problems such as anxiety disorders, major depressive illness, or substance use disorders.^[5]

The relevance of association of dermatoglyphics and schizophrenia is not to diagnose but to prevent by predicting the disease, not for defining an existing disease but to identify people with genetic predisposition. Furthermore, if a robust association can be established between fingerprint features, this can become a non-invasive and inexpensive marker for screening the subjects with predisposition for schizophrenia.

MATERIALS AND METHODS:

The afore mentioned observational study was carried out in Postgraduate Department of Anatomy, Government Medical College, Jammu and in the OPD block of Department of Psychiatry, Associated Hospital of Government Medical College, Jammu. This study consisted of 200 subjects, who were divided into two equal groups, 100 subjects in each group as follows:

Group S (Schizophrenic Group): This group consisted of 100 diagnosed cases of schizophrenia patients based on the diagnostic and statistical manual of mental disorders (DSM-IV) diagnostic criteria, attending OPD section of Department of Psychiatry, Government Medical College, Jammu.

Group C (Control Group): The controls consisted of 100 normal persons, selected randomly from general population with no psychiatric disorders in them or in their family.

Materials Required: Fingerprint duplicating ink, Glass slab, Rubber roller, White bond paper, Spirit, Soap, Water, Towel, Magnifying hand lens, Protractor, Scale, Needle, Gloves, Sanitizer

Method of Collection of Finger and Palmar Prints:

After taking informed consent from the patients/attendants, they were asked to wash their hands with soap and water so as to remove any oil or dirt. Standard Indian ink method was used for taking impressions with fingerprint duplicating ink.^[6] A small drop of duplicating ink was squeezed out on a glass slab and spread evenly by rolling over the ink with the help of rubber roller on the slab so that a thin layer was formed. After the fingers and palms were inked, rolled impressions were taken on bond paper of A4 size one by one. Rolled fingerprints were taken because they show the full pattern area. The fingerprints were then subjected to dermatoglyphic analysis with the help of magnifying hand lens, scale and ridge counting was done with the help of sharp needle. Finger ridge patterns were loops, whorls, arches and composite. All the dermatoglyphic prints were studied, tabulated and analyzed by applying statistical data.

RESULTS: Following observations were made in the present study:

Qualitative Analysis:

Arches: The pattern of arches in right hand in Group S were 6% whereas in Group C they were 11.8%. The Group S showed 7.8% of arch patterns while Group C had 14.2% of arch patterns in left hand. The decrease in pattern of arches of both right and left hands in schizophrenia patients were statistically significant between Group S and Group C ($p < 0.05$).

Ulnar loops: The pattern of ulnar loops in Right hand were lower in Group S (50.6%) when compared to Group C (57.4%). The pattern of ulnar loops in Left hand of Group S (48.8%) were lower than Group C (56.8%). The decrease in pattern of ulnar loops of both right and left hands were statistically significant between Group S and Group C ($p < 0.05$).

Radial loops: Radial loop type pattern was seen least among all the dermatoglyphic patterns in both schizophrenics and controls. Radial loops were seen more in Group S as compared to Group C. The radial loops in Right hand were (2.6%) in Group S and in Group C they were (0.6%). The pattern of radial loops in left hand were (3.4%) in Group S and (1.4%) in Group C. The increase in pattern of radial loops of both right and left hands were statistically non-significant when compared between Group S and Group C ($p > 0.05$).

Whorls: The pattern of whorls in both right and left hands were higher in Group S when compared to Group C. The pattern of Whorls in right hand in Group S were 40.81% and in Group C were 30.2%. The Group S showed 40% of Whorl patterns while Group C had 27.6% of Whorl patterns in left hand. The pattern of radial loops of both right and left hands were statistically significant between Group S and Group C ($p < 0.05$).

DISCUSSION: Qualitative analysis:

Arches: In the present study, the frequency of arches in both right and left hands were decreased in patients of schizophrenia when compared to controls. These results were statistically significant.

Jan N et al., (2018)^[7] and Bandlamudi S et al., (2015)^[8] also reported decreased frequency of arches in schizophrenia patients. On the other hand, the observations concluded in present study were not supported by **Rajib Prasad et al., (2014)^[9] and Latiff AKA et al., (2019)^[10]**

Ulnar loops: The conclusions of the present study were positively supported by **Jan N et al., (2018)^[7] and Latiff AKA et al., (2019)^[10]** who noted decreased pattern of ulnar loops in both right and left hands in schizophrenic patients when compared to controls. This finding is also in concordance with **Sunita U et al., (2013)^[11], Kudalkar UN and Madhale NR (2016)^[12], Bandlamudi S et al., (2015)^[13]**, who also found that there was decrease in ulnar loops in schizophrenics. On the contrary, the results of **Gupta A et al., (2020)^[14]** showed disagreement with the results of present study and concluded that there was significant increase in Ulnar loops in

schizophrenic group. Also, **Norovsambuu O et al., (2021)^[15]** found no significant differences in mean counts of loops in schizophrenics as compared to controls.

Radial Loops: Radial loops were seen more in schizophrenia patients when compared to controls. This finding correlates with **Jan N et al., (2018)^[7]**, **Kudalkar UN and Madhale NR (2016)^[12]** and **Latiff AKA et al., (2019)^[10]** who also observed increase in radial loops in hands of schizophrenia patients when compared to controls.

Whorls: The pattern of whorls in both right and left hands were higher in schizophrenia patients when compared to controls. This finding is in concurrence with studies of **Jan N et al., (2018)^[7]**, **Bandlamudi S et al., (2015)^[13]**, **Sunita U et al., (2013)^[11]**, who reported increased frequency of whorls in schizophrenia patients when compared to controls. The results of present study were negated by **Norovsambuu O et al., (2021)^[15]** who could not find significant difference in mean pattern of whorls in schizophrenics when compared with controls.

CONCLUSION: The Qualitative analysis of the present study revealed the following results:

- **Arches:** The frequency of arches in both right and left hands were decreased in schizophrenia patients when compared to controls.
- **Ulnar loops:** Ulnar loops pattern in both right and left hands were lower in schizophrenia patients when compared to controls.
- **Radial Loops:** Radial loops were seen more in schizophrenia patients when compared to controls.
- **Whorls:** In the present study, the pattern of whorls in both right and left hands were higher in schizophrenia patients when compared to controls.

Thus, from the present study it appears that there do exist a variation in the dermatoglyphic patterns in Schizophrenia. When combined with clinical features, the use of dermatoglyphics can be used as a reliable genetic marker in the screening of high risk people for the early detection in Schizophrenia.

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