Panacea Journal of Medical Sciences 2022;12(1):204–208

Content available at: https://www.ipinnovative.com/open-access-journals

Panacea Journal of Medical Sciences

Journal homepage: http://www.pjms.in/

Original Research Article

Fingerprint patterns in carcinoma cervix patients: A comparative study

Prateek Shrivastava[1], Ankit Jain[2], Rashmi Jain[3,*], Radhika Sharma[4]

[1]*Dept. of Anatomy, Government Medical College, Shahdol, Madhya Pradesh, India*
[2]*Dept. of Anatomy, Shyam Shah Medical College, Rewa, Madhya Pradesh, India*
[3]*Dept. of Pathology, Shyam Shah Medical College, Rewa, Madhya Pradesh, India*
[4]*Indian Institute of Public Health, Gandhinagar, Gujarat, India*

ARTICLE INFO

Article history:
Received 18-02-2021
Accepted 24-05-2021
Available online 30-04-2022

Keywords:
Fingertip pattern
Carcinoma cervix
Ink method
Dermatoglyphics

ABSTRACT

Background: Etiology of cervical cancer consist of many factors like genetics, environmental factors etc. Fingertip patterns are formed under genetic control early in development but may be affected by environmental factors during first trimester of pregnancy. These patterns may represent the genetic makeup of a person and therefore his/her predisposition to certain diseases including carcinoma cervix. So this formed the basis of our study where we evaluated fingertip patterns as anatomical marker of carcinoma cervix.

Materials and Methods: An analytical and comparative study done on 100 histo-pathologically confirmed cervical cancer patients and 100 age-matched normal healthy controls. Their fingerprints were analyzed to assess the association of cervical cancer with the fingertip patterns. Fingerprints were obtained by 'Ink method' as it was mentioned by Cummins and Midlo. Data on differences in patterns of cases and controls were tested for it's statistical significance.

Results: Statistically significant lower number of arch patterns was observed in the fingerprints of both hands combinedly of the cancer patients as compared to controls. It was also seen that the percentage frequency of arch pattern when compared separately for right and left hands of cancer patients and controls, the frequency of arch pattern was statistically significantly lower in left hands of cases than controls.

Conclusion: So it can be concluded that there are significant difference in fingertip patterns of cervical cancer patients from healthy people and Dermatoglyphics i.e., the study of ridge pattern on the finger, palm and soles may be utilized to identify the people at risk of carcinoma cervix.

1. Introduction

The fingertip patterns which represent the pattern of ridges on epidermal layer of skin of palms and the soles is genetically determined, and fingerprint examinations done for criminal investigations is based on it's knowledge, it has also been proven helpful in the field of medical genetics.[1] Various type of diseases occurring because of alteration in genes have been positively correlated with fingerprint patterns in many previous researches conducted independently. Heart diseases, cancer, and Alzheimer's disease are some of the many diseases that have been correlated with fingerprints.

Finding out the subjects those who are at greater risk of developing cancer as early as possible to reduce the morbidity and mortality due to malignancy is of utmost importance in any cancer related study. Since many years cervical cancer has been one of the major cause of mortality among women all over the world.[2] Carcinoma of cervix stands second in position of all the cancers affecting

* *Corresponding author*.
E-mail address: pshrivastava015@gmail.com (R. Jain).

https://doi.org/10.18231/j.pjms.2022.038

women worldwide. In developing countries like India it holds a big share of 80% cases of cancer in women.[2] It has been found that like many other type of cancers cancer cervix also has common etiological factors like genetic, environmental.[3] It's incidence is increasing among relatively younger women in the age group of 25 to 45 years.[4] There are many causative factors for developing cancers in humans but it's ultimate transformation in to malignant stage is due to genetic changes that disturbs growth of cell. Relatives or family members of carcinoma cervix patients have higher chances of developing pre-cancer or invasive cervical cancer in comparison to people with no family history of any kind cancerous disease.[5] Due to high account of death rate and morbidity rate it affects the financial stability of the family[6] and also causes great loss to the country.[7] The screening procedures available now are invasive in nature & costly also and a well established diagnostic set up is needed for it. There are many causative factors of cervical carcinoma with genetic make up of a person is significantly one of them. As both dermatoglyphics and cervical cancer has genetic background, this study was carried out to find any relation between these two.[8]

So fingertip patterns may act as marker which is purely anatomical in nature to find out risk of developing cervical cancer. It is very valuable because it is affordable, consumes very less time and totally non-invasive in nature. No specific setting is needed for it, any kind of repetition is not required and never requires to admit the patient in hospital. Fingerprints can be taken to screen the people who have higher chances of developing cancer from the community and help medical professionals to timely advise and lead them to go under confirmatory tests to further investigate cervical cancer.

2. Objectives

1. To take the fingertip patterns of right and left hands of cervical cancer cases and to compare it with fingertip patterns on both hands of healthy controls.
2. To evaluate fingerprints as non-invasive anatomical marker of carcinoma cervix.
3. To find patterns most commonly associated with cervical cancer.
4. To compare the results with similar studies done earlier in other parts of world.

3. Material and Methods

This research was observational, analytical and comparative study which was done after getting approval from Institutional Review Board of M.G.M. Medical College & M.Y. Hospital, Indore on March 20^{th}, 2017. One hundred cases of carcinoma cervix who were between of 20 to 60 years of age group and were under treatment in the Department of Government Cancer Hospital, Indore (M.P.) and one hundred female controls matched for age, who were medically fit without any chronic disease and with no family history of cancer or any other hereditary diseases were randomly chosen among medical students, faculty members, female doctors and nursing staff of M.G.M. Medical College and M.Y. Hospital, Indore. Those cases who had hereditary disorders other than carcinoma cervix like hypertension, schizophrenia, mental retardation and diabetes were not included in the study. Written and properly informed consent was obtained from both cases and controls. Fingerprints were obtained by 'Ink method' as it was mentioned by Cummins and Midlo.[9] As per the methodology described according to ink method the hands of both the cases and controls were washed proper manner using soap and water and any left out oily secretion was cleaned using spirit , after waiting for few minutes for the hands to dry, All fingers were kept on the ink pad one by one and their palmar surfaces were rolled over it from one border of the nail to the other side border, so that whole print of the tip of finger bearing the pattern is thoroughly smeared with ink, then the prints were obtained for each finger of the two hands of each subject on a A4 size white paper while keeping it over the hard and flat table top and rolling the palmar aspect of finger tip on the paper from its lateral border to medial border firmly, the prints obtained were recorded and analysed with the help of a hand lens. The percentage frequency of fingertip patterns like arches (Figure 1), loops (Figure 2) and whorls (Figure 3) of cases and controls were observed and studied for statistical significance using 'chi square' test.

4. Observation and Results

Table 1 shows comparison of total number of different varieties of dermatoglyphic patterns in cases and controls in their both hands combinedly. It was found that percentage frequency of whorls altogether in cancer patients were 41.11% while in normal females the total percentage frequency of whorls were 38.89%. The p-value = 0.56 was more than 0.05, from which we can understand that between the total percentage frequency of whorls as compared in cases and controls was not significant statistically.

On comparison of total number of arches in cancer cases with the healthy controls it was observed that percentage frequency arches were lower i.e. 6.48% in cases whereas it was 9.90% in controls and p-value of 0.02 is lower than 0.05 which is significant statistically. When percentage frequency of total number of loops was compared with total number loops in controls, it was observed that the percentage frequency of loops in cases was 52.41% and in controls it was 50.91% which was though lower than the cases but the difference was not significant statistically as obtained p-value of 0.32 is higher than 0.05. All the type of patterns were also further compared in right and left hands

of cases and controls seperately.

Table 2 depicts the percentage frequencies of whorls, loops and arches in right hands of carcinoma cervix cases and control groups, and it is found that there is no statistically significant difference between both the groups for any kind of fingertip pattern in right hands.

Table 3 shows the percentage frequencies of loops, whorls and arches in left hands of carcinoma cervix cases and control group,and it was found that there is statistically significant difference in frequency of arch pattern between cervical cancer patients (6.83%) and controls (10.82%) in left hands with p- value (0.03). Whereas there is no significant difference in percentage frequency of loops and whorls between cases and controls.

Fig. 1: Arch pattern

Fig. 2: Loop pattern

Fig. 3: Whorl pattern

5. Discussion

About loop pattern – A research article published in 1985 and it was stated in that there is significant decreased frequency of loops on fingertips of carcinoma of cervix patients.[10]

Results of another study showed low frequency of loops in both the hands of carcinoma cervix cases.[11] Results of similar kind of study demonstrated significant reduction in percentage of loops in both hands of cancer cervix cases as compared to normal females.[12] Whereas in a different study it was observed that carcinoma cervix cases had higher percentage frequency of loop pattern on their right hands as well as left hands as compared with normal females which was significant statistically.[13]

In other study it was found that cancer patients had significantly lowpercentage of loops as compared to controls.[14] In a separate research it was found that loop pattern is statistically low in a significant manner in carcinoma cervix cases as compared with normal healthy females.[15] In present research it was found that there is no statistically significant difference between the occurence of loop patterns on fingerprints of cases and controls

About arch pattern – In a research it was found that frequency of arches was statistically significant higher on fingertips of carcinoma cervix patients in comparison to normal females.[10] In another study conducted about dermatoglyphic features of carcinoma cervix patients and normal controls it was found that there is significantly higher frequency of arches in left hand in cases in comparison to controls.[11] In a different study observed significant increase in frequency of arches among cancer patients as compared to healthy females.[14] Whereas in our study findings are contrary to the results of above cited studies with arch pattern in both hands combinedly higher with statistical significance in normal healthy females in comparison to carcinoma cervix patients, Specifically this difference was significant statistically when compared in

Table 1: Percentage frequency of various patterns on fingertips in all fingers of right and left hands of cervical cancer patients and normal healthy females

Fingertip pattern	Cases n=1000	Controls n=1000	P value	Significance
Whorls	41.11%	38.89%	0.56	N.S.
Loops	52.41%	50.91%	0.32	N.S.
Arches	6.48%	9.90%	0.02	Significant

Table 2: Percentage frequency of various patterns on fingertips in all fingers of right hand of cervical cancer patients and normal healthy females

Fingertip pattern	Cases n=500	Controls n=500	P value	Significance
Whorls	40.37%	38.16%	0.54	N.S.
Loops	52.96%	52.84%	0.97	N.S.
Arches	6.7%	8.99%	0.25	N.S.

Table 3: Percentage frequency of various patterns on fingertips in all fingers of left hand of cervical cancer patients and normal healthy females

Fingertip pattern	Cases n=500	Controls n=500	P value	Significance
Whorls	41.85%	40.18%	0.64	N.S.
Loops	51.85%	48.99%	0.44	N.S.
Arches	6.3%	10.82%	0.03	Significant

left hands of cases and controls.

About whorl pattern – In a research it was found that there is statistically significant higher count of whorls in carcinoma cervix cases in comparison to controls.[16] In an another research it was observed that in fingertip patterns of carcinoma cervix patients there is significant rise in the frequency of whorls in both hands as compared with normal healthy females.[11] In a different research it was found that there is significantly higher percentage frequency of whorls in both hands of cervical cancer cases in comparison to control group.[12] In a study it was shown that there is significant increase in percentage frequency of whorl pattern in carcinoma cervix cases as compared to controls.[17] In an another study also high count of whorls among cervical cancer patients was found when compared with normal subjects.[15] In our study no statistically significant difference was found in presence of whorl pattern in cervical cancer patients when compared with normal females. The differences in results obtained by different researchers may be due to the variation in population group, sample size, and geographic location chosen by them

6. Conclusion

Many previous studies have suggested through extensive research that a direct correlation exists between the fingerprint patterns of a person and their medical and behavioural profile. In our study also we found correlation between fingertip patterns and cervical cancer, as one can observe from our results that there is significantly less frequency of arch pattern in carcinoma cervix patients. This suggests that there may be a chance that presence of arch pattern may be protective of cancer cervix. Though more extensive research is needed to be done with larger sample size including participants from different ethnicity, region and race to get more authentic results which might alter from the outcome of present study. However it is well known that carcinoma cervix very commonly affects women in our country and screening as many women as possible with prompt management can save many lives. Hence pattern of ridges on fingertips may be beneficial in finding out women at risk of cancer in a highly populated nation like India with finite facilities specially in peripheral or underdeveloped parts where advanced screening procedures are not affordable and can be a cost-effective, non-invasive anatomical marker to determine the individuals with risk of cervical cancer.

7. Conflict of Interest

No conflict of interest.

8. Source of Funding

None.

References

1. Moore KL, Persaud TVN, Torchia MG. Before we are born: essentials of embryology and birth defects. 1st Edn. India: Elsevier India; 2016.
2. Park K. Textbook of preventive & social medicine. 16th edn. India: Banarasidas bhanot publisher private limited India; 2000. p. 288.
3. Patil KV, Kulkarni PR, Diwan CV. Study of Dermatoglyphics in the occurrence of the carcinoma of cervix. *Int J Recent Trends Sci Technol*. 2015;14(3):653–5.
4. Park K. Textbook of preventive and social medicine. 23rd edn. India: Banarasidas bhanot publisher private limited India; 2013. p. 388.

5. Wattamwar PP, Hosmani P. Study of dermatoglyphics in carcinoma cervix. *Int J Anat Res*. 2016;4(2):2349–53.
6. Arrossi S, Matos E, Zengarini N, Roth B, Sankaranayananan R, Parkin M, et al. The socio-economic impact of cervical cancer on patients and their families in Argentina, and its influence on radiotherapy compliance:Results from a cross-sectional study. *Gynecol Oncol*. 2007;105(2):335–40.
7. National Commission on Macroeconomics and Health. "Report of the National Commission on Macroeconomics and Health", NCMH, Ministry of Health and Family Welfare, Government of India, August 2005.
8. Pramanik A, Bhattacharya A. Study of fingertip pattern in Carcinoma Cervix patients. *IJSRP*. 2018;8(5):141–6.
9. Cummins H, Midlo C. Finger Prints, Palms And Soles: An Introduction To Dermatoglyphics. *Am J Phys Anthropol*. 1943;2(2):227–9. doi:10.1002/ajpa.1330020212.
10. Pal GP, Roufal RV, Bhagwat SS. Dermatoglyphics in carcinoma cervix. *J Anat Soc India*. 1985;34(3):157–61.
11. Inamdar VV, Vaidya SA, Kulkarni PR, Devarshi DB, Kulkarni S, Tungikar SL, et al. Dermatoglyphics in Carcinoma Cervix. *J Anat Soc India*. 2006;55(1):57–9.
12. Kashinathappa BS, Khanzode LS. Study of palmar dermatoglyphics in carcinoma of cervix. *Int J Cur Res Rev*. 2013;5(4):136–40.
13. Umana U, Ahunna CO, Timbuak JA, Ibegbu AO, Musa SA, Hamman WO, et al. Dermatoglyphics and Cheiloscopic patterns in cancer patients. *CRJBS*. 2013;5(5):220–5.
14. Patil KV, Kulkarni PR, Diwan CV. Study of Dermatoglyphics in the occurrence of the carcinoma of cervix. *IJRTSAT*. 2015;14(3):653–5.
15. Baluskar SK, Khanzode L. Study of palmar dermatoglyphics in carcinoma of cervix. *Int J Cur Res Rev*. 2013;5(4):136–40.
16. Floris G, Sanciu MG, Sanna E. Dermatoglyphics in pathology with emphasis on breast cancer and cervix carcinoma. *Int J Anthropol*. 1990;5(2):125–8.
17. Reddy SS, Ahuja YR, Reddy O. Dermatoglyphic studies in carcinoma of the cervix. *Indian J Hered*. 1977;9(3):35–40.

Author biography

Prateek Shrivastava, Tutor

Ankit Jain, Assistant Professor

Rashmi Jain, Assistant Professor

Radhika Sharma, Masters in Public Health

Cite this article: Shrivastava P, Jain A, Jain R, Sharma R. Fingerprint patterns in carcinoma cervix patients: A comparative study. *Panacea J Med Sci* 2022;12(1):204-208.