JPAFMAT, 2004; 4. *ISSN 0972-5687*

DETERMINATION OF SEX FROM HAIR

Dr. Harpreet Singh, Resident, Forensic Medicine
Dr. R.K.Gorea, Professor and Head, Forensic Medicine
Government Medical College, Patiala
Dr. O.P.Aggarwal, Professor, Forensic Medicine, M.M.Medical College, Mullana, Ambala
Dr. O.P.Jasuja, Professor, Forensic Science, Punjabi University, Patiala

ABSTRACT

For determination of Sex of a person, root sheath of hair can be used as it is easy to obtain and is non-invasive. Barr bodies identify female sex and male sex is identified by the presence of fluorescent Y bodies. In this study 50 cases (25 male and 25 females) were studied. Present study indicates that reliable sex identification is possible up to eight months when the samples are kept in a dried condition.

KEYWORDS: Sex Determination, Barr bodies, Y- bodies

INTRODUCTION

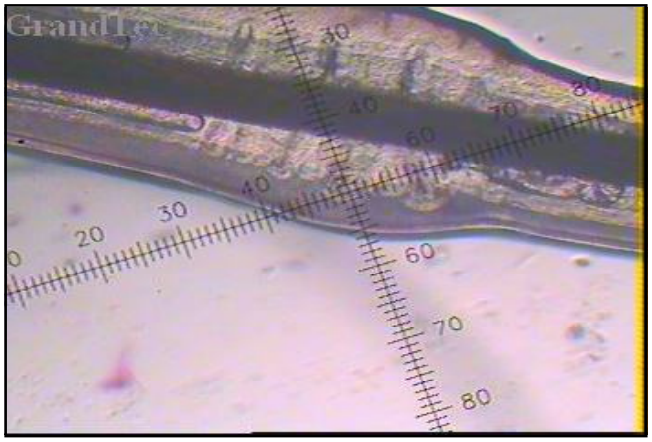
It is crucial for solving criminal case to determine sex of a person in many situations. When hairs are present as circumstantial evidence these can help in solving the puzzle when it may not be possible from any other evidence. Hair can found in hands of victim, on the lethal weapon and may be present on clothes, mattresses etc. In Forensic medicine sex from hair can be determined in decomposed bodies and mutilated bodies. Root sheath cells are resistant to autolysis hence sex determination can be done even in decomposed bodies. The sex chromatin i.e. Barr body was first found by Barr and Bertramm [1] in the nuclei of the nerve cells of cats. Zech [2] demonstrated that the distal portion of Y chromosome showed marked florescence after staining with Quinacrine mustard.

MATERIAL AND METHOD

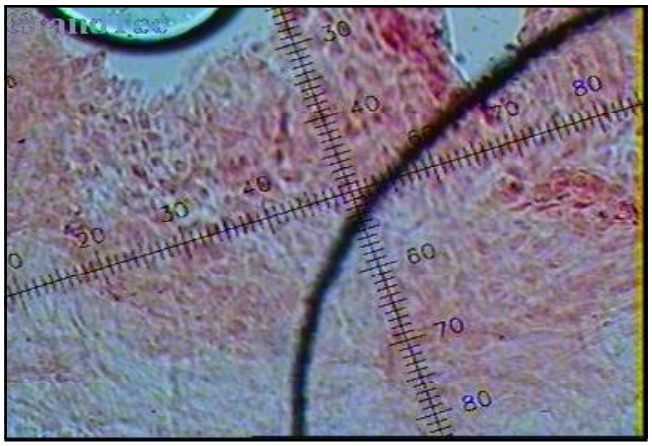
Hair are taken from scalp of 50 dead bodies (25 males + 25 females) coming to mortuary of Govt. medical college & Rajindra Hospital Patiala. Hair are plucked and kept in plastic bags under dry conditions. Hairs of females are stained by Aceto-Orcein staining and male hairs are stained by 0.5%. Quinacrine mustard. We studied the hair after monthly intervals.

The bulb of hair root in removed by the blade of scalpel and root sheath is slipped off the shaft. Root sheath is stained by Aceto-Orcein [3}. The material is compressed under a cover slip to obtain a monolayer of cells. Then in the suitable views 100 cells are studied under 40x and 100x objective of microscope for Barr bodies.

Root sheath cells are removed on the glass slide, fixed and stained by 0.5% Quinacrine dihydrochloride (sigma) for 5 min., then treated with citrate phosphate buffer (pH 5.5) for 15 minutes for colour conditioning and were mounted with phosphate buffer (pH 7.4) [4]. They are examined under 40 X and 100 X of Fluorescent microscope [Olympus Fluorescent microscope model BHF]



Photograph 1: Showing Intact Root Sheath



Photograph 2: Showing Barr Bodies

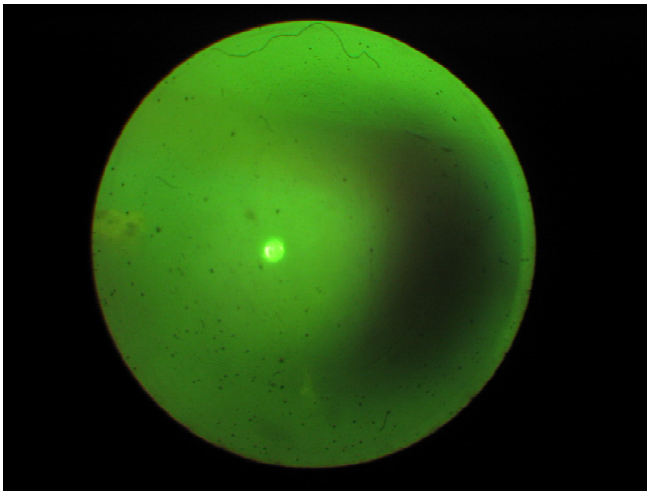


Photo 3: Showing flourescent spot in hair root cell 400x

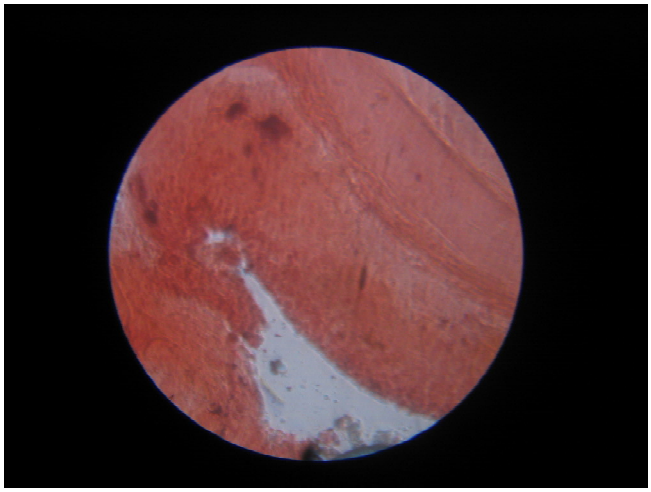


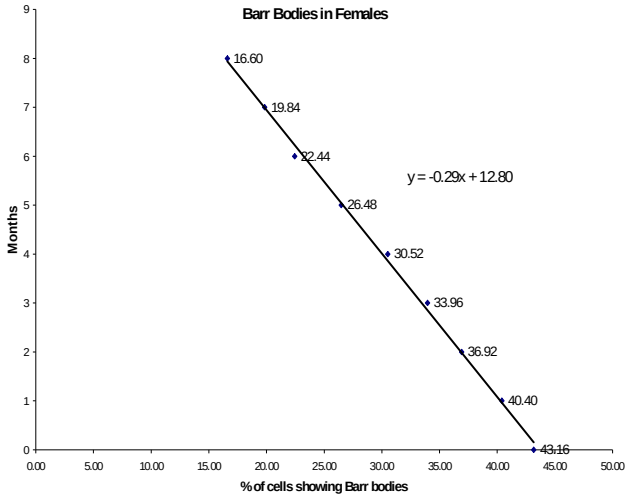
Photo 4: Showing microscopic view of hair root cell

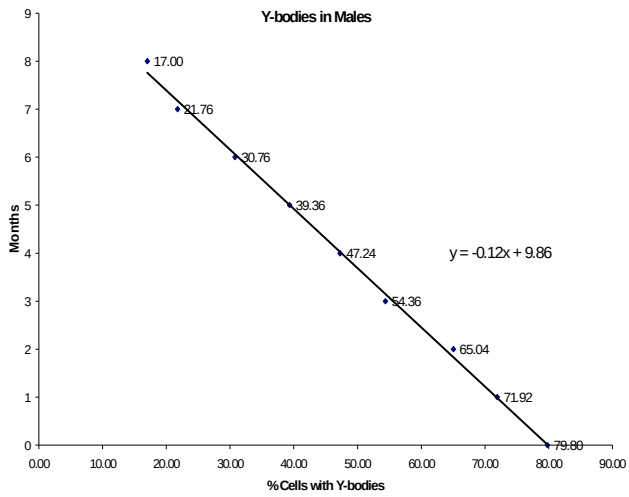
RESULTS & DISCUSSION

In the specimens of female hair, the Barr bodies are identifiable with the frequency of 22% to 47% of cells. The samples were examined for eight months at monthly intervals. It was found that in 18 cases sex could be easily identifiable up to 8 months. In one case it was not possible to determine sex after three months. The average range of fall of sex chromatin after one month was 45%-25% (average 35%), after two months 42%-18% (average 30%) after three months 38%-18% (average 28%), after fourth month 38%-20% (average 29%) after fifth month 38%-20% (average 29%), after sixth month 35%-20% (average 27.5%) after seventh month 30%-20% (average 25%), after eight months 29%-10% (average 19.5%).

In case of males Y chromatin is present in 70%-90% cells of male [5]. In this study the frequency of Y bodies in male hair is also 70%-90%. Reliable sex determination can be done up to eight months. The average range of fall of Y chromatin was after one month is 88%-52% (average 70%), after second month 86%-48% (average 67%), after third month 80%-36% (average 58%), after four months 76%-30% (average 53%), after five months 74%-25% (average 49%), after six months 70%-10% (average 40%), after seven months 60%-10% (average 35%) after eight months 50%-10% (average 30%). Dixon and Torr [6] were able to detect sex chromatin in the cells that remain unfixed on a blade for 5 weeks. Nagamori [7] was able to recognize sex from hair up to four weeks. Nagamori and Takeda [8] were able to distinguish male and female sex from hair up to 32 weeks.

In the present study reliable sex identification is possible up to eight months, if the samples kept in dried conditions.





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