

## SCREENING OF PRESENCE OF EXTRA Y CHROMOSOME IN AGGRESSIVE TALL MALES OF NORTH INDIAN REGION

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### ABSTRACT

**Background:** Aggression has been hypothesised with biological instinctual theory, frustration theory and social learning theory. The biological instinctual theory was based on hereditary factors and is associated with XYY syndrome.

**Objectives:** To find out the presence of extra Y chromosome in aggressive taller males of north Indian region.

**Materials and Methods:** Buss and Perry questionnaire was used to find out the aggression of the subjects. The height was measured with the help of metallic tape. Quinacrine dihydrochloride and MacIlvaines Buffer was used to stain the buccal smear slide for the general screening of the number of Y chromosomes. The conventional metaphase was prepared for the confirmation of number of Y chromosomes and the slides were stained with giemsa.

**Observations:** The aggression was found more in taller males and they had no extra Y chromosome.

**Conclusions:** Extra Y chromosome may be the cause of aggression and more height in males. But in the present study of males of north Indian region no extra Y chromosome was found in aggressive and taller males.

**KEYWORDS:** Extra Y chromosome, Aggression, Tall height.

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### INTRODUCTION

Aggressive, impulsive and criminally inclined males are mostly found to carry extra Y chromosome and they also tend to be tall and with low intelligence [1]. Avery Sandberg recorded the first case of XYY chromosome in 1961 and its incidence is 1:1000 [2]. The XYY chromosome syndrome, a numeric aberration, has been described with higher prevalence among prisoners and individuals with mental retardation [3]. This high rate indicated that the XYY condition could indeed be linked to increased

violent or antisocial behaviour [2]. Along with aggressive behaviour they are also found to be taller with average height 188cm (6 feet 3 inches) [4]. Further studies have revealed that patients with extra Y chromosome are not only dangerous, violent, and with criminal behaviour but they are also found to have severe personality disorder of indeterminate cause [5]. The present study was done to screen the presence of aggression and extra Y chromosome in taller males.

## MATERIALS AND METHODS

The study was done on 500 tall males in Department of Anatomy, MMIMSR, MMU, MULLANA, after taking IEC approval. Males with height 175cm and above between 21 to 55 year age were included in the study. Males with height less than 175 cm and with any physical abnormality were excluded from the study. Height was measured in centimetres with the help of metallic tape. Aggression of these subjects was tested first with the help of Buss and Perry questionnaire.[6] This questionnaire had 29 questions under 4 factors.

**Physical:** 1) Once in a while I can't control the urge to strike another person. 2) Given enough provocation, I may hit another person. 3) If somebody hits me, I hit back. 4) I get into fights a little more than the average person. 5) If I have to resort to violence to protect my rights, I will. 6) There are people who pushed me so far that we came to blows. 7) I can think of no good reason for ever hitting a person. 8) I have threatened people I know. 9) I have become so mad that I have broken things.

**Verbal:** 10) I tell my friends openly when I disagree with them. 11) I often find myself disagreeing with people. 12) When people annoy me, I may tell them what I think of them. 13) I can't help getting into arguments when people disagree with me. 14) My friends say that I'm somewhat argumentative.

**Anger:** 15) flare up quickly but get over it quickly. 16) When frustrated, I let my irritation show. 17) I sometimes feel like a powder keg ready to explode. 18) I am an even-tempered person. 19) Some of my friends think I'm a hothead. 20) Sometimes I fly off the handle for no good reason. 21) I have trouble controlling my temper.

**Hostility:** 22) I am sometimes eaten up with jealousy. 23) At times I feel I have gotten a raw deal out of life. 24) Other people always seem to get the breaks. 25) I wonder why sometimes I feel so bitter about things. 26) I know that "friends" talk about me behind my back. 27) I am suspicious of overly friendly strangers. 28) I sometimes feel that people are laughing at me behind me back. 29) When people are especially nice, I wonder what they want.

## Y chromosome detection was done by following methods:

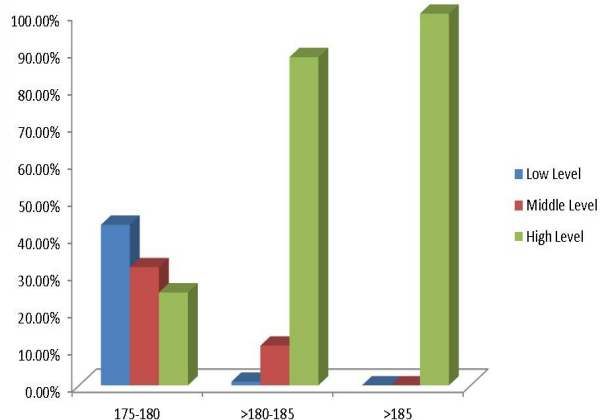
**Buccal smear staining:** Buccal scrapping was taken with the clean wooden spatula, spreaded on the slide and was fixed in absolute methanol. Slides were then stained with 0.5% aqueous solution of quinacrine dihydrochloride, washed with water and then mounted with Macllvaines buffer at pH 5.6. Buccal smear was scanned for the presence of Y chromosome under fluorescent microscope. Slides were scanned for the Y chromosome under the oil immersion lens (100 X) using Nikon Eclipse 80i fluorescent microscope. A bright yellow dot appeared representing the Y chromosome. The number of yellow dots represents the presence of number of Y chromosomes.

**Karyotyping (Confirmatory method):** Above observations were confirmed with chromosome analysis done by karyotyping with conventional method.

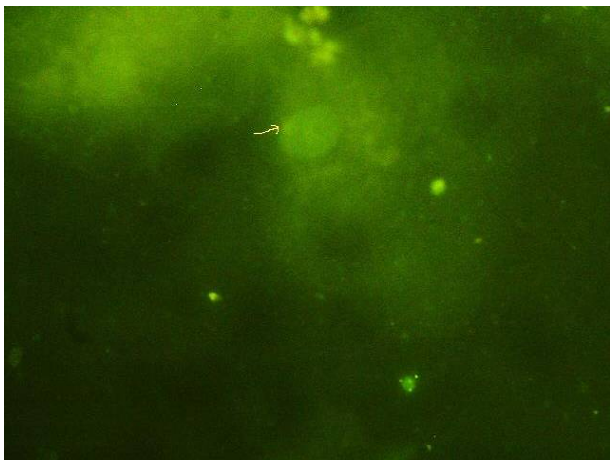
## OBSERVATIONS

In present study on observation of aggression questionnaire (Fig. 1) it was found that subjects with low, medium and high level of aggression were 32%, 25.6% 42.4% respectively. According to height - 43.2% males of height 175-180cm were in low aggression level group, 31.8% in medium aggression level group and 25% in high aggression level group. Males of 180-185cm group were maximum (88.3%) in high level aggression group. All the males of height e"185cm were in high aggression level group. On analysing Y chromosome it was found that no subject had extra Y chromosome.

Fig. 1: Height groups with various levels of aggression.



**Fig. 2:** Arrow showing Y chromosome with Quinacrine Dihydrochloride staining.



**Fig. 3:** Arrow showing Y chromosome with Quinacrine Dihydrochloride staining (In contrast).



**Fig . 4:** Metaphase showing presence of single Y chromosome(In circle).



## DISCUSSION AND CONCLUSIONS

In the present study it was observed that increase in height of males was significantly associated with the high level of aggression. However no extra Y chromosome was observed in any of the subjects indicating that tallness with aggressive behaviour may not necessarily

associated with extra Y chromosome. Although Clark et al also found a positive correlation between extra Y chromosome and height however he has also reported no correlation between extra Y chromosome and aggression/criminality when a comparison between penalised normal criminals and cases of Klinefelter syndromes were studied [7]. Most of the previous studies have pointed to the preponderance of the XYY genotype among aggressive, impulsive and criminally inclined persons who also tend to be tall and of low intelligence [1]. Many earlier studies say that the extra Y chromosome is the main factor of aggression in males and described a high number of males with XYY in prisons and mental hospitals [8]. A study on criminals and psychiatric patients reported a significant correlation of extra Y chromosome with height as well as aggression [1,8,9,]. Another study reported increased levels of testosterone with extra Y chromosome hence postulated that Y chromosome produces testosterone and excess androgens in circulation primes the developing central nervous system to its greater aggressive tendencies. The presence of extra Y chromosome can thus potentiate the chain of events leading to the development of excessively aggressive individual [10]. However Shirley found no significant difference in testosterone levels among XY, XYY and XXY males [11]. This means effect of testosterone levels on aggression is controversial.

So far all the studies regarding extra Y chromosome were done on criminals and psychiatric patients while the present study is done on the normal tall males who have shown no extra Y chromosome despite of tallness and high level of aggression. Therefore it can be concluded that aggression and tallness is not correlated with extra Y chromosome but there can be other environmental factors responsible.

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**Conflicts of Interests: None**

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