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Available online at: http://www.iajps.com ***Research Article***

CONSANGUINEOUS MARRIAGE AS A RISK FACTOR FOR ATTENTION DEFICIT HYPERACTIVE DISORDER (ADHD) AMONG OFFSPRING

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Abstract:

Background: *Research based evidence highlights prevalence rates of Attention Deficit Hyperactive Disorder (ADHD) ranging from low to high. The differing prevalence of ADHD in western and eastern countries is hypothetically related to cultural, biological and family factors. Whether consanguinity is one of the risk factor, is a burning question.* ***Objective:*** *To analyze consanguineous marriage as a risk factor for ADHD among offspring.* ***Methods:*** *This cross-sectional, observational analysis was carried on a sample of 50 children (suffering from ADHD) chosen via non-probability consecutive sampling. The subjects presenting to the outpatient department of Sir Cowasjee Jehangir Institute of Psychiatry, Hyderabad from January 2018 to June 2018 were enrolled into the study after taking written informed consent from their guardians/parents. The subject's guardians/parents were asked to fill in a pre-structured, interview based questionnaire containing inquiries about basic sociodemographic details, parent consanguinity and detailed disease particulars of the children. The data obtained was analyzed using MS. Excel 2013 and SPSS v. 19.0.* ***Result:*** *The mean age of the subjects was 8 years (±2 SD), with 84% of the subjects being males and the remaining 16% being females. 62% of the subjects hailed from urban background and 38% hailed from a rural setting. 60% of the subjects lived in a joint family together with their parents while the remaining 40% lived in nuclear families. The mean family size, i.e. the mean number of people living together in the family stood at around 12. It was revealed upon inquiry, that 76% of the ADHD patients had a parental history of consanguinity.* ***Conclusion:*** *After carefully considering the results, it can be concluded that consanguineous marriage is a strong risk factor for ADHD among progeny, with more than three quarters of all ADHD patients screening positive for parental consanguinity.*

Keywords: *Attention Deficit Hyperactivity Disorder (ADHD), Consanguinity, Marriage, Psychiatric Disorder, Cousin Marriage and Hereditary Psychiatric Disorder.*

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INTRODUCTION:

Over the previous many years, reports have surfaced that raise concerns regarding childhood inattentiveness and hyperactivity. [1] Attention deficit hyperactivity disorder (ADHD) affects almost all facets of a child's life. ADHD, one of the commonest disorders among school aged children, [2] is among the foremost causes of academic underachievement at school and disruptive behavior at home. The disruptive symptoms of ADHD may be produced by an array of neurological dysfunctions in the brain, but the causal mechanism which results in ADHD is yet to be fully understood and thus remains a subject of scientific discussion. [3]

Despite the high prevalence, limited information is available regarding this phenomenon among non-western cultures, particularly in the south-east Asian region. [4] Pakistan is faced with one of the greatest rates of consanguinity (82.5%) in the world with 44% of marriages taking place between first cousins and 38.4% of the marriages taking place amongst those related more distantly. With both, a markedly high prevalence of ADHD and the rampant practice of consanguineous marriages, it is only natural to assume that the two may be related. It is thus important to analyze whether the high prevalence rate of ADHD among progeny is due to the highly consanguineous population. [5]

Consanguinity', the common term used for cousin marriage or inter-family marriages among close relatives, originates from the Latin words, con – "shared" and sanguis – "blood". In consanguineous marriages, each partner inherits genes from a common ancestor for example a grandparent. The practice is particularly prevalent in the Middle Easter and South Asian nations with rates far exceeding forty percent of all marriages.

Over the passage of the last decade evidence based literature supporting our hypothesis has continued to accumulate, further validating our belief. ADHD symptoms persist into adulthood in thirty to seventy percent of children suffering from the disorder. [6, 7] In addition to that, children suffering from ADHD may suffer from functional impairment across multiple areas including school, home and social relationships. ADHD reportedly has long-term side effects on vocational success, academic performance and emotional/social development. [3] Among youngsters, ADHD is linked to a heightened risk for accidents. [8] As they age, children with unresolved ADHD, in conjunction with conduct disorders, experience antisocial behavior, drug abuse and risk for impaired social adjustment and facing co-morbid disorders as well. [9]

Epidemiological evidence has brought forth various rates of ADHD symptoms ranging from 3.2% to 87.5%. [5] The potential difference in the prevalence of ADHD around the world is related to biological, cultural and family factors. [10] Since no single scale gives a 100% accurate diagnosis, we used multiple scales (Vanderbilt Assessment Scale, Conners Rating Scale, Weiss Functional Impairment Rating Scale and more) so obtain more accurate results with regard to ADHD, its type variant and the respective hyperactive symptoms.

We thus investigated the prevalence of consanguinity among parents of children presenting with ADHD in an attempt to analyze consanguineous marriage as a risk factor for ADHD among progeny.

METHODOLOGY:

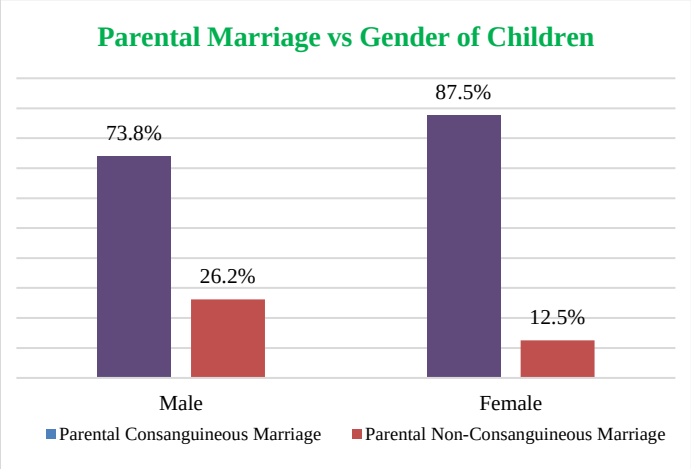
This cross-sectional, observational analysis was conducted among a sample of 50 children (suffering from ADHD) chosen via non-probability consecutive sampling. The subjects presenting to the outpatient department of Sir Cowasjee Jehangir Institute of Psychiatry, Hyderabad from January 2018 to June 2018 were enrolled into the study after taking written informed consent from their guardians/parents. The subject's guardians/parents were asked to fill in a pre-structured, interview based questionnaire containing inquiries about basic sociodemographic details, parent consanguinity and detailed disease particulars of the children. The data obtained was analyzed using MS. Excel 2013 and SPSS v. 19.0.

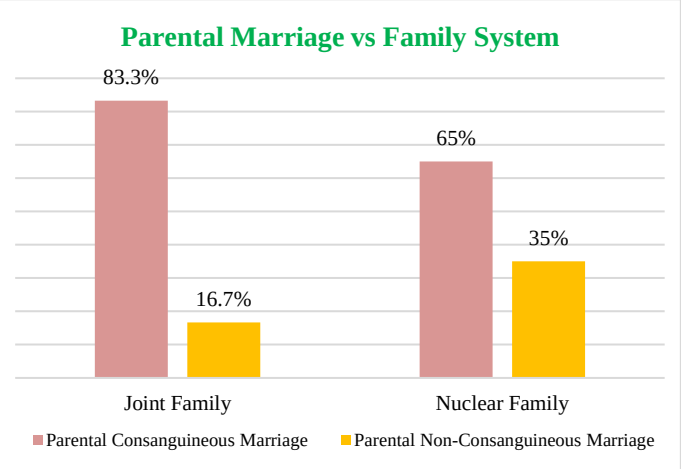
RESULTS:

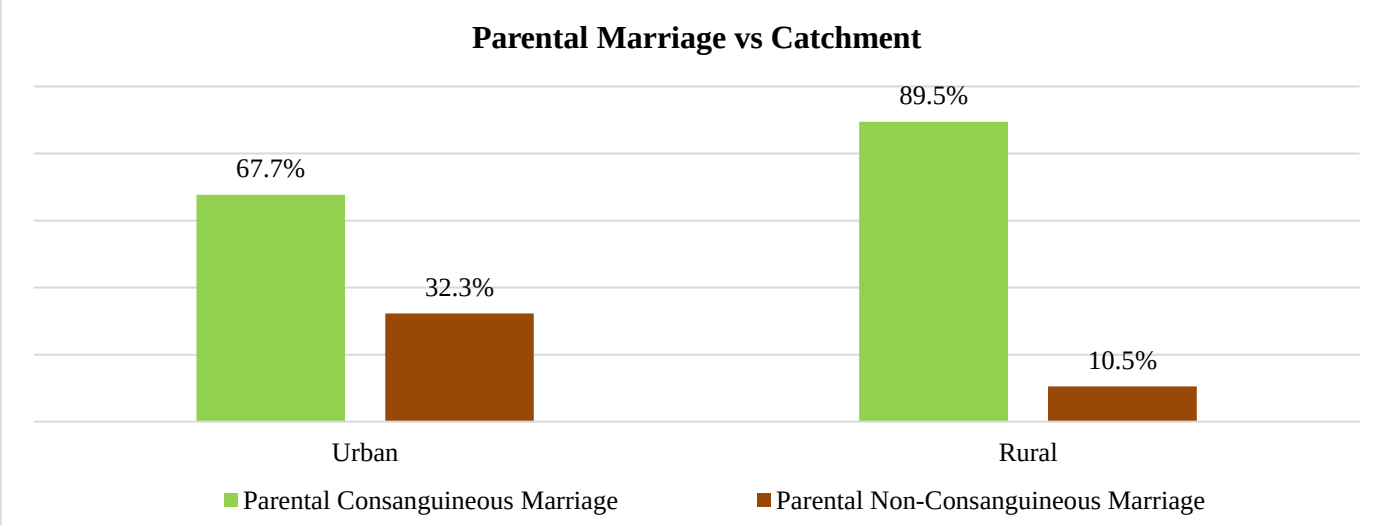
The mean age of the subjects was 8 years (±2 SD), with 84% of the subjects being males and the remaining 16% being females. 62% of the subjects hailed from urban background and 38% hailed from a rural setting. 60% of the subjects lived in a joint family together with their parents while the remaining 40% lived in nuclear families. The mean family size, i.e. the mean number of people living together in the family stood at around 12. It was revealed upon inquiry, that 76% of the ADHD patients had a parental history of consanguinity.

SAMPLE DISTRIBUTION	
Sample	n = 50
Age	Mean Age = 8.15 ± 2.35
Gender	Boys = 84% Girls =16 %
Catchment	Urban = 62% Rural =38%
Parental Marriage	Consanguineous = 76% Non-Consanguineous = 24%
Family Type	Joint = 60% Nuclear = 40%
Family Size	Median = 10

Consanguinity among parents of ADHD children was found to be more associated with female gender of child, joint family system and rural catchment.

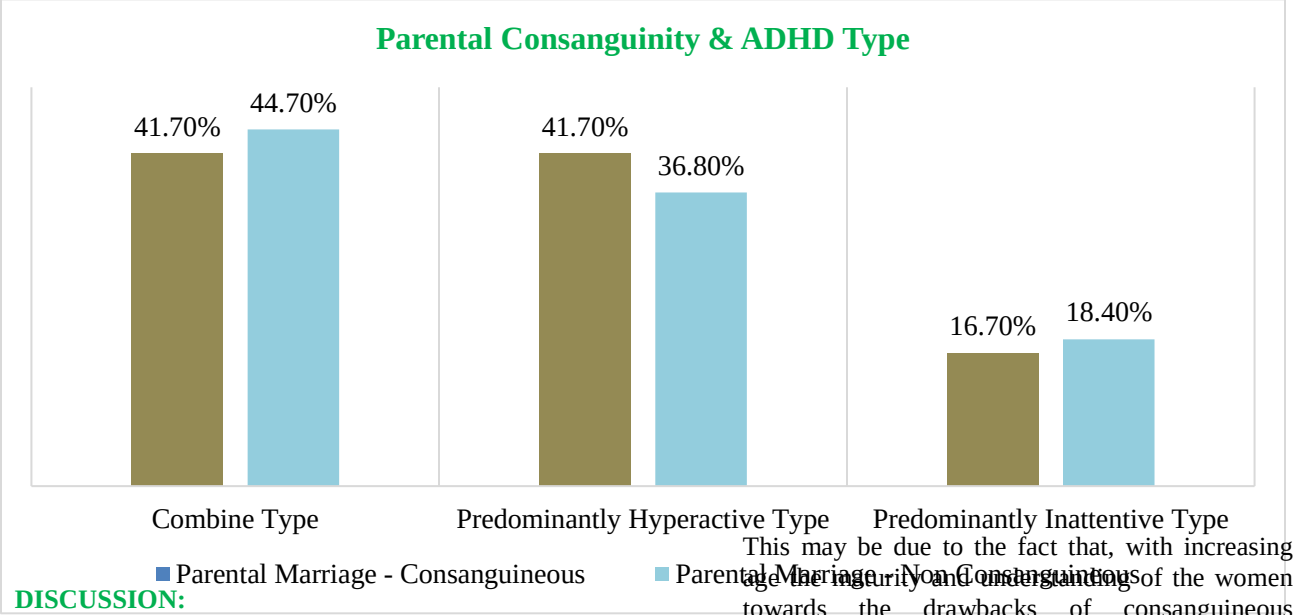






Further interviewing using internationally tested & validated questionnaires revealed the individual types of ADHD observed in the sample subjects. It was noted that combined type was most prevalent (both among children of consanguineous and non-consanguineous marriages).

Predominantly hyperactive type of ADHD was more prevalent among children from consanguineous marriages while predominantly inattentive type of ADHD was more prevalent among children from non-consanguineous marriages.



DISCUSSION:

The rate of prevalence (5%) of ADHD in Pakistan falls well within the range of four percent to nineteen percent reported for the Middle East, the western world and central Asia. [11 - 13] There is significant difference in the estimates of ADHD prevalence around the world. The variability could be associated with the different methodologies applied in the different studies, thereby making an adequate comparison very difficult to achieve. Consanguineous marriage continue to take place around the world, particularly in Pakistan, despite being known to have been linked to a heightened risk for a wide array of complex genetic disorders.

According to the latest statistics provided by the Pakistan Demographic and Health Survey (PDHS), more than fifty percent of the married women (aged fifteen to forty nine years) in the country are married to their first cousins. Marriage to second cousins, when included, brings up the percentage of consanguinity from 60.3 to 71.2. An additional 11.3% are bounded by married to other relatives while the remaining (over 17.5%) are married out of the family (near and distant). This national demographic survey also brings forth the fact that women who married at eighteen years of age, were more often married to first cousins than their more aged counterparts. [14]

This may be due to the fact that, with increasing age the maturity and understanding of the women towards the drawbacks of consanguineous marriage tend to increase.

Discrete urban-rural discrepancies surfaced. Marriages to cousins in urban areas were less prevalent than in rural areas. This can be explained by the fact that the educational status of the individuals residing at urban areas is higher and thus they are more aware of the psychiatric health repercussions that such marriages yield in the progeny. The educational status among females was important with respect to first cousins marriages: over fifty percent were un-educated, an estimated forty eight percent were educated up to the primary level the small remaining percentage were educated to the middle and higher level. Indicating that more educated women preferred less to consent to consanguineous marriage. The mean age of women at marriage when the spouse was a cousin was lesser than when the women were married out of the family. This may result in a greater fertile period and thus a probability of giving birth to more children that are susceptible to psychiatric problems such as ADHD. [14]

The ill-effects on the health linked to consanguinity are reportedly brought about by the translation of rare, recessive genes inherited from a common predecessor. A thorough review of the results revealed that predominantly hyperactive type of ADHD was most aligned, among all the other types, with consanguineous marriage indicating a stronger possible link of the condition with consanguinity.

It is also believed that consanguinity is common among parents of individuals suffering from schizophrenia. [15] In addition to mental health disorders, progeny of consanguineous marriages is more likely to suffer from diseases including cancer, heart diseases, gastro-intestinal disorders, hypertension, hearing deficit, diabetes mellitus, blood disorders and bronchial asthma in comparison to progeny of non-consanguineous marriages. [16] Yet consanguineous marriages are still the prevalent norm in many parts of the world, especially ours.

CONCLUSION:

After carefully considering the results, it can be concluded that consanguineous marriage is a strong risk factor for ADHD among progeny, with more than three quarters of all ADHD patients screening positive for parental consanguinity. Hence despites its strong customary roots, it should be discouraged on medical grounds.

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