

What We Know About the Genetic Determinants of Human Homosexuality? A Short Review Communication

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Abstract

“Homosexuality”, “sexual orientation disorder”, “egodistonic homosexuality”, “unspecified sexual disorder”, “sexual maturity disorder” and “sexual relationship disorder”. Since 1948, these have been, throughout the history of the Diagnostic and Statistical Manual of Mental Disorders (DCM) and the International Statistical Classification of Diseases and Related Health Problems (ICD), the terms used by the scientific community to categorize the homoaffective spectrum until in 2017, in the face of strong social and academic demand, their complete disengagement from any terminology that categorizes them as physical and/or mental illness. On the other hand, some areas of science have contributed substantially to a better understanding of this subject, such as genetics and epigenetics. Today, although the scientific community still offers some points of resistance, especially in more conservative countries, it is a consensus that since the implementation of the genome project there has been a considerable methodological expansion that has opened new possibilities of studies that have allowed this advance.

Keywords: Homosexuality; Human Homosexuality; Genetics; LGBTQIA+ Community.

1. Introduction

“Homosexuality”, “sexual orientation disorder”, “egodistonic homosexuality”, “unspecified sexual disorder”, “sexual maturity disorder” and “sexual relationship disorder”. Since 1948, these have been, throughout the history of the Diagnostic and Statistical Manual of Mental Disorders (DCM) and the International Statistical Classification of Diseases and Related Health Problems (ICD), the terms used by the scientific community to categorize the homoaffective spectrum until in 2017, in the face of strong social and academic demand, their complete disengagement from any terminology that categorizes them as physical and/or mental illness. Despite this conceptual advance, the counterproductive effects of the pathological association of homosexuality are still evident. In Brazil, for example, the current historical and political moment has given rise to debate on the subject, above all because of the remarkable rise of movements for the restoration of the family, morals, ethics, and “good manners” – a fact that highlights the still present and erroneous pathological notion of homosexuality in various social spheres. On the other hand, some areas of science have contributed substantially to a better understanding of this subject, such

as genetics and epigenetics. Today, although the scientific community still offers some points of resistance, especially in more conservative countries, it is a consensus that since the implementation of the genome project there has been a considerable methodological expansion that has opened new possibilities of studies that have allowed this advance.

2. Methodology and systematic results

The systematic review took place in April 2020 in the PubMed network and resulted in 1470 references; the search was composed from the term “homosexuality” necessarily described in the title of each study. Considering the restricted range of the subject, there was no implementation of limits for the year and for the language of publication of the articles. The screening process took place by sequentially reading the title, abstract and full text, respectively, which resulted in 15 selected scientific articles. Although preliminary and with some caveats regarding the scientific quality of the selected studies – once methodological biases were identified in nine of them – it was possible to collect a total of 14 findings regarding the genetic determinants of human homosexuality according to the results of the primary randomized clinical trials and other systematic reviews that made up the final selection body.

3. Main genetic findings extracted

a) In men, sexual orientation is correlated with the number of siblings, so that for each older heterosexual brother born, the chances of the next child being homosexual increase by approximately 33%; b) this correlation with the fraternal birth order is true regardless of the number of women born among the siblings; c) the occurrence of a homosexual child, however, does not alter the chances of the next child also being homosexual; d) after each pregnancy of a male fetus the woman presents, in comparison with the previous pregnancy, a significant increase of H-Y antibodies, with the caveat here that these antibodies are inoperative and have no practical effects described so far; e) the incidence rates of homosexuals in the human species are mathematically consistent enough to exclude the hypothesis that it would be the result of successive random mutations in the DNA; f) contrary, therefore, to the Darwinian logic, the evidence from population studies allows us to suggest that the process of natural selection is occurring in favor of the maintenance of homosexuality in humans, taking into account the time of existence of the species *Homo sapiens*; g) the statistical interpretation of the epidemiological and epigenetic studies already carried out allows us to suggest that, although gene multiplicity may be strongly involved, the occurrence of homosexuality in humans may be being understood as advantageous from the evolutionary point of view of the species; h) it is virtually impossible so far, however, to reasonably assume the reasons why this occurs; i) reproductive disorders such as infertility, premature ejaculation and erectile dysfunction are less prevalent in homosexual men than in heterosexual men. However, other aspects such as delayed ejaculation or an-ejaculation are more frequent; j) when analyzing frequency distribution, family grouping, ethnic asymmetry, and sibling agreement, population patterns observed empirically point strongly to the genetic inheritability of homosexuality. However, environmental factors such as the social and educational scope of the individual play a relevant role in modulating the gene expression of the phenotype of homosexual behavior; k) they also point out that these environmental factors statistically have a greater influence on the occurrence of female than male homosexuality; l) however, in both genders, in the absence of the genetic factor, the isolated occurrence of these environmental factors has little or no influence in determining

the individual's sexual orientation; m) the GWAS (Genome Wide Association Study) type studies indicate that of all the discordant genes identified so far, two are statistically more expressed in the homosexual population: the SLITRK and TSHR genes that respond, respectively, to neural activity and to thyroid regulation; and, n) all population studies published so far show that the agreement on sexual orientation among univiteline twin siblings is significantly higher (from 48 to 76%) than in heterozygotic siblings.

4. Final considerations

The genetic influence in the determination of sexual orientation is already widely consolidated in the field of medical sciences, however new studies are necessary given the high methodological variability between them. Most of the genetic researches carried out so far deal exclusively with male homosexuality, so it is essential to broaden the focus of these studies in order to increase, also in the scope of scientific publications, the representativeness of the other segments of this population. Nevertheless, it is a consensus that most of the homophobic argument is based on the assumption, at the common sense level, that sexual orientation and gender identity are factors that can be chosen and that, consequently, in this semiotics, they would be reversible. It is in this sense that the dissemination of this knowledge beyond the academic world is so important and can, within the limits of medical ethics, contribute to the debate and to the continuity of the struggle for a more egalitarian and less discriminatory society as far as the LGBTQI+ community is concerned.

5. Competing Interests

The authors declare no competing interests.

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