SERIES I: IDENTICAL TWINS

Identical twins receive a great deal of public attention due to their physical similarities. Yet, they can be very different from each other even though they share the same genes Fingerprints, palm prints and foot prints are similar in patterns but are never exactly alike. Prenatal and postpartum influences may lead to differences in size, appearance, and personality. Some identical twins look less alike at birth than fraternal twins and may begin to resemble each other only after they are several months old.. The Louisville Twin Study Found that same-sex fraternal twins were more similar in birth length than identical twins.

Other notable differences in identical twins can be attributed to an interesting phenomenon called mirror imaging. Approximately twenty five percent of identical twins are mirror image twins. Mirror imaging is a condition in which various asymmetries in the twins' bodies are reversed. For example, they may have opposite hair whorls, dental patterns, or birthmarks. One twin may also be left-handed and the other right-handed, and they may cross their arms and legs in opposite ways. In rare cases, one twin's organs may be located on the wrong side of his/her body which is a condition that sometimes appears in Siamese twins. Therefore, researchers have concluded that mirror imaging is unique to identical twinning and will most likely occur if the egg separates late in development.

Another reason for the differences between some identical female twins can be explained by a theory called lyonization. All human females receive one X chromosome from their mother and one from their father and are therefore identified as XX. Lyonization is the inactivation of one X chromosome which occurs very early in development. The X chromosome that is inactivated can vary between identical female twins. This could explain why differences in personalities and other traits exist for some identical twin pairs. Recent studies have shown that if X-inactivation occurs before the fertilized egg splits, the patterning will be more alike between identical twins than if it occurs after the fertilized egg splits. The implication is that some identical female pairs will be more similar for traits on the X chromosome, compared to other pairs.

Researchers are still trying to determine the cause of identical twinning. According to the Twinship Sourcebook, identical twins occur at a rate of about one in 240 births among the Caucasian population. This twin type occurs due to the division of a single fertilized egg between one to 14 days after conception. Up until now, this division was presumed to be a random act of nature without any genetic component. However, new research suggests that there is an enzyme in the male sperm that causes the embryo to split into two separate embryos. Therefore, a hereditary factor could be involved where the father passes the enzyme gene onto his son(s) since it's in the sperm and therefore in the "Y" chromosome. This theory could explain why identical twins tend to run in certain families. Preliminary case studies have shown that the enzyme caused the splitting of chromosomes in 99% of the people tested. This splitting resulted in the division of cytoplasm, producing two eggs. However, more research is needed in order for experts to conclude that an enzyme is directly responsible for the phenomenon of identical twinning.

Whatever the cause of identical twinning, most parents of identical twins prefer to look at their children as a blessing instead of an unexplained act of nature. Parents and family members typically appreciate the uniqueness of each identical twin. They must encourage others to treat them as individuals even though they may appear alike.

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