

Indian twin registry: A gold mine for genetic studies



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Twins are a source of curiosity, both for the family and the scientific community. Genetic similarities between twins have been the preferred choice to study the heritability of traits.¹ The fact that nature and nurture play a significant role in shaping one's phenotype has prompted Geneticists to use twins as a proxy to address this fact.² Based on the similarities, twins are of two types, monozygotic twins (MZ) and Dizygotic twins (DZ).³ Identical or monozygotic twins are formed when one fertilized egg (ovum), fertilized by one sperm, splits and develops into two embryos (Figure 1) with precisely the same genetic information.⁴ The combined ratio of MZ and DZ to singleton delivery is approx 1: 100.

On the other hand, fraternal or dizygotic twins are formed when two eggs (ova) are fertilized by two sperm and produce

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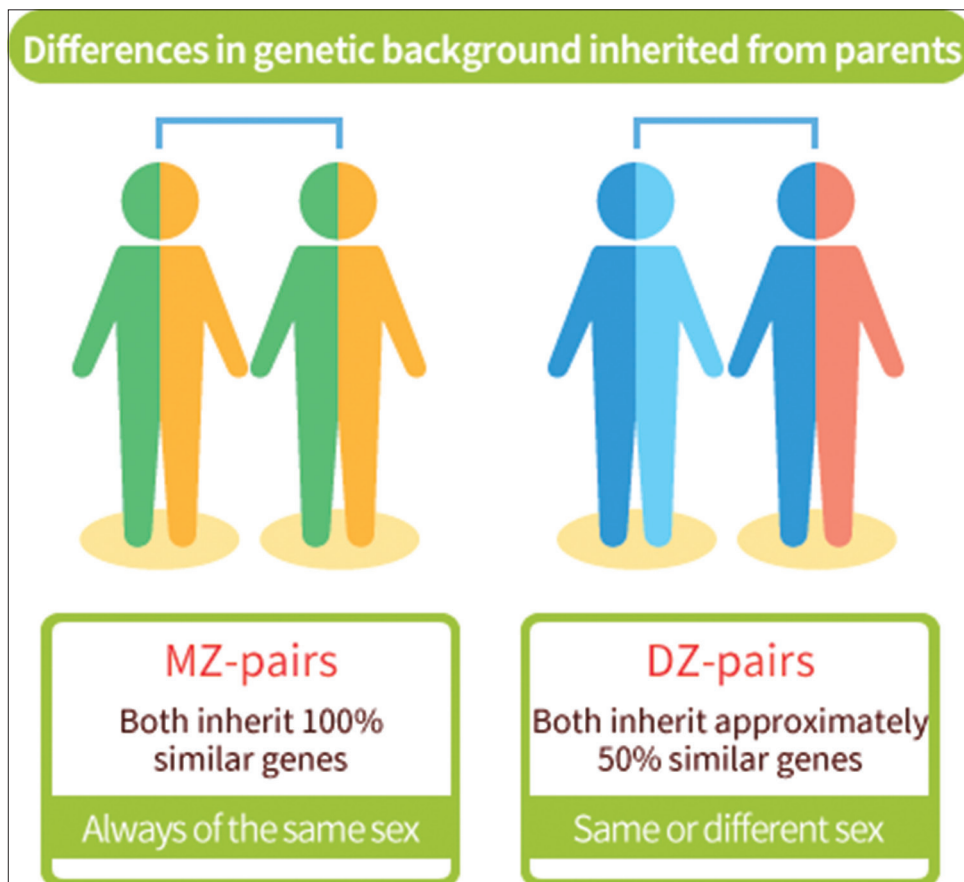


Figure 1: Ref: https://www.med.osaka-u.ac.jp/pub/twin/en/twin_research/twins

two genetically unique children in the same pregnancy. Monozygotic twins are genetically identical, sharing the same placenta. If more than two twins share the placenta, these are monozygotic multiples. Monozygotic twins occur in 0.3% of all pregnancies. Monozygotic (identical) twins share all their genes, while dizygotic (fraternal) twins only share about 50%. Hence, any similarity seen between identical twins when comparing the similarity between sets of fraternal twins for a trait or condition is most probably due to genes rather than environment.⁵

TWIN REGISTRIES

Progress in twin research worldwide is carried out by establishing Twin registries or consortia based on collaborations of several twin families. These registries are a rich source of materials for Twin research. It is much needed to establish such Twin registries in India.⁶⁻⁸ With its 1.5 Billion population, Indian Twin registries can be a source of materials for Twin Research for the whole world.

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