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How can we Pinpoint Genetic Involvement in Antidepressant-Induced Suicide?

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During the early 1990s, emergence of patients' suicide receiving antidepressant, especially in children was reported [1]. By enter into this millennium, the US and European regulatory agencies began implementing verification programs to assess the influence on suicidal behavior from the use of antidepressants such as SSRIs [2-4], drug's safety in patients has renewed as a criteria indispensable for approving or withdrawing a new drug. Just following this dilemma, we hypothesized that human's genetic makeup might affect the occurrence of suicide in patients receiving antidepressants [5]. Now many reports support the argument that human's genetic makeup also decides antidepressant-induced suicide [6,7]. The question is how to pinpoint genetic involvement in antidepressant-induced suicide. There are many controversial in solving this technical problem.

Whether the Score Systems are Scientific

Since the real successful suicide rate in patients is very small, it impedes the genetic study of the relationship between suicide and antidepressant intake. More recently, new studies are focusing on the relationship between suicidal ideation score systems and genetic variations in patients [8]. These types of studies can accumulate more statistical data but decrease the objectivity in explaining genetic involvement. Many factors can challenge suicidal ideation score systems. However, most of our clinical data are based on suicidal ideation system. The obvious drawback of present suicidal or other neural studies is that we do not know the scientific values of score system—Are the current score systems scientific and quantifiable? Whether the score systems are biased between individuals? The negative answer we can draw from current system, especially suicidal ideation score systems. In the future, we ought to improve these systems or change our focus into new way. E.g. suicidal ideation score system is a subjective score systems of somewhat insane person to give. Can we use some score systems made by psychiatry practitioners, e.g. madness score systems. The average of two systems can be used in statistical analysis. We can compare genetic statistical data from these two parallel systems to draw some useful conclusions.

In the future, can we get genetic information from optogenetics study (inserted a gene for a light-activated protein) to probe how brain work change by antidepressants in mice or other animals? These sets of data may be better used as statistical analysis and quantifications. The optogenes we used in studies may be the genes of biomedical importance or preliminary screened of positive related in clinics. The more new genes we investigate, the more knowledge and understanding we can expect from the study.

Whether there is Overlap between Different Genetic Locations in Drug Toxicity Occurrence

In our opinions, future genetic or chemical structural studies of drug toxicities shall be focused on finding the overlaps of different chemical structures on producing same type of toxicities or more genetic location variants overlapping in producing one type of toxicities. We believe these researches have high scientific values and they can be useful in drug design, drug approval or withdrawal and drug manufacture and prescribing [9].

Is it Related with Genome's 'Dark Matter'?

We now know that protein-coding regions accounted for just 1.5% of the genome. Could the rest of our DNA really just be junk? [10]. Are the repetitive "junk" DNA or epigenetic systems related with drug-induced neural toxicity? This is a novel question needs to be answered.

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