Personalized medicine benefits and drawbacks essay

Science, Genetics

Abstract

In this paper, I will explain the benefits and limitations of personalized medicine. Current scientific progress acknowledges that both genetic and social factors influence health outcomes, but the personalized model is not yet a part of mainstream medicine. Further research and clinical implementation of personalized treatments could improve contemporary healthcare by creating more positive health outcomes among the population. However, certain obstacles, such as morality issues and lack of regulations, could permanently damage the public's trust in personalized medicine. Despite the potential drawbacks, the personalized model will allow a better understanding of the human body and disorders at the molecular level, and diagnostic tests will become more objective, evidence-based, and accurate. That knowledge will allow accurate treatment choices and increase health recovery rates among the population if the system manages to bypass the obstacles of implementing personalized care.

Personalized Medicine: Benefits and Drawbacks

If all human beings are individuals with a distinctive genetic signature who are exposed to different environmental influences, the personalized medical model will allow healthcare professionals to customize medical treatments and improve their positive outcomes on the population. However, the personalized approach is a complex model which will require further investments in multidisciplinary studies that will investigate the complex interactions between several factors. Furthermore, there are several possible

drawbacks, such as lack of genetic understanding among the population or the potential risk of genetic discrimination development, which could implicate the advantages of scientific development towards a personalized medical model. Despite the existing and potential limitations of the personalized medical model, the personalized medical model has the potential to improve treatment outcomes and the population’s health status if society can utilize its advantages and overcome the obstacles.

Current advances in genetics allow a greater understanding of diseases at the molecular level. Healthcare professionals will understand the genetic signatures of tumors and diagnostic tests for all chronic condition will become more accurate (Hamburg & Collins, 2010). The investigation of common diseases at the molecular level will allow scientists to establish different subtypes and create more therapeutic possibilities, so the public will benefit from greater chances of health recovery (Hamburg & Collins, 2010). Understanding disorders at the molecular level will allow healthcare professionals to identify and focus on the causes of disorders immediately rather than studying symptoms and relying on clinical judgment. A personalized approach will enable more accurate and evidence-based treatments, so the quality of care will definitely increase.

Improvement of treatment choices is the main goal of personalized medicine, and it is the greatest benefit of the personalized approach. Current clinical research requires testing treatment outcomes on a larger sample, and only treatments that prove successful on a representative sample allows healthcare professionals to generalize conclusions about treatment

outcomes across the entire population. Even with a high probability of positive treatment outcomes, a statistical analysis of treatment effectiveness is never 100 percent accurate. Although the current level of genetic research and ability to understand the interactions does not allow 100 percent accuracy in the personalized model, further research could potentially allow a greater accuracy in treatment choices. Healthcare professionals understand that responses to treatments can vary significantly, and that the current healthcare model frequently overlooks important factors, such as social factors, that influence health significantly (Garber & Tunis, 2009). A personalized model will take more factors in consideration, and it will allow healthcare professionals to make more decisions based on evidence rather than clinical judgment.

Even though the personalized approach requires more research, morality issues regarding personalized medicine are discussed. The main concern is that the knowledge of reading and manipulating genetics will allow more negative consequences if that knowledge is misused (Garber & Tunis, 2009). Furthermore, a regulatory structure and the operating infrastructure of the healthcare system would have to adapt to the personalized medical model, and those changes would require a significant amount of time and resources (Hamburg & Collins, 2010). Without safety regulations and changes in the healthcare infrastructure, it will not be possible to utilize all advantages of personalized care. If the system fails to implement appropriate measures and regulations, the personalized model could develop negative outcomes rather than deliver its benefits to the public, and social paradigms the public

will form about personalized care will not allow the public to trust the personalized approach again.

Most importantly, the safety of personalized medical treatments based on genetic risk factors should be fortified with more scientific research in the area of genetics. Besides the high financial cost of DNA sequence analysis and interpretation, further research is required to increase the understanding of disease causes and potential treatments (Feero, Guttmacher, & Collins, 2008). New markers for common chronic disorder risk factors are being discovered, and the prognosis of potential disorder manifestation is not yet accurate. Feero et al. (2008) suggest that clinical applications of genetic-based prognosis and treatments is limited by the lack of understanding of how the risk contribution of certain markers could vary across several groups, how much the inheritance of several markers could account for disease manifestation, and the interaction of genetic factors with environmental factors.

Although several roadblocks exist in creating a functional system based on the personalized medicine model, scientific research continues because the advantages of understanding both internal and external factors that contribute to disease development together allows the creation of more effective medical treatments than any healthcare professional can offer today. The development of personalized medicine further will require significant increase of genetic literacy among the entire population because they will have to understand the new perspectives of medicine and transform existing paradigms on health, disease, and medical treatments. A

higher degree of genetic literacy among the public and further research on risk factor interactions will allow the complete development of personalized medicine to ensure diagnostic accuracy, treatment choice accuracy, and prevent potential discrimination or misuse of scientific knowledge.

References

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