

PERSONALIZED MEDICINE ARE THE MYTH FOR THE REPUBLIC OF MOLDOVA?

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Abstract: *Personalized medicine has emerged as a concept to help address these challenges with strategies for prevention, diagnosis, and treatment tailor-made for individuals or groups of individuals. The aim is to make sure that patients receive the specific interventions that work best for them and that time and money is not wasted on trial and error.*

Key words: *Personalised Medicine, Covid-19 pandemic, challenges*

JEL CLASSIFICATION: I 1

1. INTRODUCTION

Personalized medicine is a promising new concept for dealing with challenges of health and health systems.

Furthermore, many medicines do not effectively treat some patients or are even harmful, as illustrated by the finding that over 6% of acute hospital admissions are caused by serious adverse reactions to medicines.

2. THE TERM USED IN EUROPE IS PERSONALIZED MEDICINE:

"Personalized medicine refers to a medical model using characterization of individuals' phenotypes and genotypes (e.g. molecular profiling, medical imaging, lifestyle data) for tailoring the right therapeutic strategy for the right person at the right time, and/or to determine the predisposition to disease and/or to deliver timely and targeted prevention."

Other terms that are used by the global community are "precision medicine," "stratified medicine," "individualized medicine," "genomic medicine," "pharmacogenomics," and "P4 medicine" (for personalized, predictive, preventive, and participatory). (Mimmesgern Nimmesgern., E., et al. (2017).

In ancient times, ~1550 BC, the first evidence about medicine adapted to individual's health appeared in the *Odyssey* written by Homer.

The adaptation of that ancient "***Egyptian medicine***" to an individual's health status was further elucidated in the Classical period from Herodotus when the practice of medicine was divided into categories and every doctor was a specialist for one disease, one body part.

Although "***Hippocratic medicine***" shares similarities with the Egyptian, the former does not undermine the latter. In contrast, Hippocrates used the knowledge of Egyptian medicine and advanced it by removing the magico-religious part and making it more rational (Jouanna, J. (2012)).

This approach began to change in the 1870s, when discoveries made by researchers in Europe allowed the advent of a "***scientific medicine***," a precursor to the evidence-based medicine.

In the early 1950s, scientists started to realize progressively the need for "***evidence-based medicine***." The prediction of drug response to ensure the safety of the patient as well as a better outcome gave birth to the field of today's "***personalized medicine***."

Initiatives in personalized medicine have been launched in many parts of the world. Perhaps best known is the precision medicine initiative launched by US President Obama in his State of the Union address in January 2015.

In Europe, efforts are under way to implement personalized medicine, as recognized in the conclusions of the Council of the European Union at its meeting on 7 December 2015.

General Secretariat of the Council to Delegations; Document number 15054/15: Personalised medicine for patients – Council conclusions (Personalised medicine for patients (7 December 2015), Brussels, SAN 428, Council of the European Union).

At the EU level, reflections on personalized medicine started in 2010 with a series of workshops on different research areas that can contribute to this new model of practicing medicine. The results of the workshops fed into the conference “Perspectives in Personalized Medicine” organized in 2011 by the European Commission.

A report on “Use of ‘-omics’ technologies in the development of personalized medicine” was published in 2013 as a first European policy document in the field.

European Commission 25.10.2013 SWD (2013) 436 final: Commission staff working document: Use of ‘-omics’ technologies in the development of personalized medicine.

The German Academy of Sciences Leopoldina has published a report on individualized medicine and the German Ministry for Education and Research issued an Action Plan for Individualized Medicine.

The French National Alliance for Life Sciences and Health, AVIESAN, has recently issued its Genomic Medicine 2025 plan, as commissioned by French Prime Minister Valls.

Aviesan alliance nationale pour les sciences de la vie et de la santé: Genomic medicine France 2025, www.aviesan.fr, website in French. The ‘genomic medicine France 2025’ plan can be downloaded in English from this website.

3. WHY PERSONALISED MEDICINE?

In this regard, human genome mapping was a breakthrough providing a better understanding of people's genetic make-up. Although individuals are 99.1% identical, the remaining 0.9% of interindividual genetic variability is responsible for the observed variability within the humans.

Today, the four humors of Hippocrates, blood, phlegm, yellow bile, and black bile, which determined the treatment of each individual have been replaced with the four building blocks (A, T, G, C) enabling improved medical predictions (Hippocrates (ca. 460 B.C.Bca. 370 B.C.).

4. IMPLEMENTATION OF PERSONALISED MEDICINE IN PRACTICE

In order to put this coordination into practice, the EU funded the “PerMed” project, in which representatives from EU Member States and countries associated to the EU research framework program, together with various other stakeholders, have developed a European strategy framework for personalized medicine. This resulted in a publication in June 2015 entitled “Shaping Europe's vision for personalized medicine.

The PerMed agenda defines five challenges to advance personalized medicine (Aguirre M et al (2015)):

- Challenge 1 – Developing Awareness and Empowerment
- Challenge 2 – Integrating Big Data and ICT Solutions
- Challenge 3 – Translating Basic to Clinical Research and Beyond
- Challenge 4 – Bringing Innovation to the Market
- Challenge 5 – Shaping Sustainable Healthcare

IC PerMED

The member organizations of IC PerMed will work to:

- Establish Europe as a global leader in personalized medicine research;
- Support the personalized medicine science base through a coordinated approach to research;
- Provide evidence to demonstrate the benefit of personalized medicine to citizens and healthcare systems;
- Pave the way for personalized medicine approaches for citizens.

5. PERSONALISED MEDICINE IN REPUBLIC OF MOLDOVA

- 2018- Member of IC PerMed
- 2019- First NGO in Personalized Medicine
- 2019 –Member of ICGEB (U.N. Structure)
- 2020-First International Personalized Medicine Conference
- 2021 – Preparing the Law for Biobanks

6. CHALLENGES (COVID-19)

Combining the human genome, environmental factors, disease assessments, and medication in order to achieve a better therapeutic outcome is the exact vision that personalized medicine is aiming to achieve.

A mob of problems is still around the patient's needs, which is a challenge for personalized medicine nowadays (Visvikis-Siest S., Gorenjak V., Stathopoulou M. G. (2018)).

The limitations of personalized medicine have come to the foreground nowadays due to the pandemic of coronavirus disease 2019 (COVID-19) that emerged in December 2019 in China and managed to spread rapidly in multiple countries at the beginning of February 2020.

Despite all the worldwide-recognized advances and discoveries that have been achieved, modern medicine still cannot provide a treatment with current therapeutic approaches. It is widely recognized that the genetic background of each (Gao J., Tian Z., Yang X. (2020)).

So far, several regulatory authorized diagnostic tests have been used to detect the existence of the COVID-19 virus. One of the most utilized is the RT-PCR test (real-time reverse transcription-polymerase chain reaction).

The RT-PCR test lacks the necessary accuracy and sensitivity due to the substantial percentage of "false-negative" result.

Literature suggests adopting chest CT (computed tomography) as an additional diagnostic tool in parallel with the RT-PCR test. Chest CT is a non-invasive diagnostic test with great efficiency that can minimize the false-negative cases from RT-PCR assay.

7. CONCLUSION

Today, premises are created for the development of Personalised Medicine in Republic of Moldova, but it is necessary to follow the evolution of Personalised Medicine in the countries where it is implemented.

At the same time, its implementation requires that market prices be competitive with other services.

Ethical and deontological aspects are also important, especially in interventions on the human genome.

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