



EHFG 2012: Potential of personalised medicine still underutilised – Information technologies and personal databases now paving the way to new approaches

Personalised medicine will dominate in the future. A paradigm change is occurring in medical research owing to our better understanding of genetic and environmental influences on our health and especially to new findings on the interactions of these factors. In the years ahead, the new paradigm will have increasingly concrete effects on everyday health care according to European and international experts speaking at the European Health Forum Gastein. Options to adapt and personalise examinations and therapies to fit specific individuals will increasingly improve.

Bad Hofgastein, 3 October 2012 – “Although spending on medical research has risen over the past 30 years, genuine breakthroughs for cancer, type 2 diabetes, obesity or other widespread diseases have remained modest despite all the advances. But the potential is immense,” Prof Dr Angela Brand told the European Health Forum Gastein (EHFG). Prof Brand is from the Institute for Public Health Genomics (IPHG) at the University of Maastricht and Director of the European Center for Public Health Genomics (ECPHG). She went on to explain: “One reason is that we have not yet been able to sufficiently integrate the cellular, molecular and genetic uniqueness of the individual patients in interaction with environmental factors. But truly dramatic advances in this regard are imminent.”

Stratified medicine is a first but crucial step toward achieving personalised medicine and is already being used today in many cases. Prof Brand: “Stratification means, for example, that one defines groups of patients that could derive especially big benefits from a certain therapy. For instance, based on certain genetic traits of a tumor, we can now predict very precisely for many types of cancer whether or not the given patient would benefit from chemotherapy. This is a major advance in light of the well-known stress chemotherapy causes.” Prof Brand went on to say: “A further option is to predict side-effects of medicines based on genetic profiles. This method could be used to define groups of people with more or less tolerance to a particular substance. These possibilities are already available in many cases today, but are applied too infrequently in actual practice.”

Personalised treatment strategies on the way to becoming part of everyday treatment

Genuinely personalised medicine goes a step further, however. Prof Brand: “We are moving toward being able to treat each individual person with a personalised therapy. That means, for example, that one takes stem cells out of a tumor and could activate the patient’s immune system against these cells by means of vaccinations. In this case, one treats a certain individual to fight a certain specific tumor. That is the difference between stratified and personalised medicine. These approaches are currently still in the experimental stage.” Much progress has been made with mathematic modeling that simulates the behavior of a tumor in an individual and then derives therapy recommendations from the findings. These strategies are used by the Max Planck Institute for Molecular Genetics in Berlin. Their incorporation in actual practice is imminent. However, Prof Brand noted that it has been surprisingly difficult to receive backing for this step from the medical community.

She said she is convinced that Europe could point out the global way to go with regard to personalisation: “The trend toward personalised medicine is being fostered with a number of initiatives by the European Commission and the EMA. They include, for example, the



European Alliance for Personalised Medicine, the European Science Foundation or the Public Health Genomics European Network, which drew up the European guidelines to push for the faster practical implementation of personalised medicine in health care systems.”

Innovative research strategies

There is much need for innovative approaches in everyday clinical practice. “The fact that more and more people are getting older inevitably means greater incidence of numerous diseases and thus also rising health care costs. That means the health care systems in the EU are coming under pressure,” Prof Dr Kurt Zatloukal said at the EHFG. Dr. Zatloukal is from the Institute of Pathology, Medical University Graz. Innovative strategies in prevention and therapy are needed to meet these challenges yet can only come about as a result of scientific research involving international and interdisciplinary cooperation.

Personal databases as the groundwork

Biobanks play a big role in these efforts. They are collections of human blood or tissue samples that should be networked with as much detailed information as possible about the lifestyle and diseases of the individuals from whom the samples were taken. Prof Zatloukal: “When combined with the latest technologies in analytics and data management, biobanks serve as the basis for a deeper understanding of the genetic and non-genetic causes of diseases and factors influencing the course of diseases. They are therefore the prerequisite for the further development of personalised medicine.”

These advances are being pushed in Europe by two initiatives. The pan-European Biobanking and Biomolecular Resources Research Infrastructure (BBMRI) is intended to ensure access to samples of human blood, tissue, cells or DNA and to the associated data. To be able to process this material in an innovative way, concepts are being developed in the scope of EU flagship pilot project IT Future of Medicine – ITFoM such as how to manage this enormous volume of data. Prof Zatloukal: “This development work is intended to produce computer models that allow physicians to simulate and understand diseases and therapies in a given individual and then plan their therapeutic recommendations more efficiently. Computer models also have further potential beyond this. They could replace animal studies at least in part in research on active ingredients and could change the design of clinical studies, which could greatly reduce the cost of developing new drugs.”

The EHFG is the most important conference on health care policy in the European Union. In this its 15th year, the EHFG attracts more than 600 decision-makers from 45 countries to discuss major topics on the future of the European health care system from 3 to 6 October 2012.

Please find photos of the European Health Forum Gastein using this link: <http://www.ehfg.org/940.html>.

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