

## Letter to the Editor

### Precision in psychiatry

Personalized medicine is on the rise. This is especially manifest in oncology; however, the opportunities for more precision are also great in psychiatry. Precision means a focus on individual characteristics of patients resulting in a better selection of treatment strategies to improve outcomes and reduce misdiagnoses and costs. What are the implications of precision for psychiatry?

Medicine is currently undergoing a paradigm shift. It concerns a personalization of delivered care in which diagnoses, prognoses and therapies are directly relevant for particular patients. To this end, the existing evidence-based methods are not specific enough. Evidence-based medicine is based on well-designed trials that show at best mean differences between groups of patients. As soon as we can better in predicting which patient will benefit from a treatment and which will not, it will be possible, already with the existing diagnostic and therapeutic arsenal, to lower the number of people that need treatment.

A basic assumption of personalized medicine is that each individual has to be approached as a multilevel system that is different on each level that can be discerned. Because of that, every atypical or disease process is unique and the same applies to every recovery process. This means that we can classify disorders of individual patients at most in (sometimes very small) subgroups. As cancer is a very large collection of different diseases, and even breast cancer does not exist as one type, schizophrenia, autism or mood disorders can likewise only be grouped in the same categories from a distance. This indicates, as we are increasingly learning, that every disease process is related to diverse – very specific – mechanisms.

As a consequence of these assumptions, we can discern certain trends in medical research and care: a focus on precision [see also *The Precision Medicine Initiative* of the Obama-administration (1)]; the development of better methodologies to predict and make prognoses to match the individual characteristics with the one of the ‘evidence-based’ treatment strategies; a stronger focus on prevention, early treatment and intervention, and in its wake a proactive approach; a strong emphasis on big data, as a precondition to research as deeply and broadly as possible individual characteristics; and, last but not least, more attention for the participation of patients, their relatives, and, for the purpose of prevention, consumers in general. Without active participation personalized prevention and early intervention will not work, and big data resources can only be created if consumers agree with the collection and analysis of their data. In this respect, the prevention and early detection of cancer and the ongoing call to participate in programmes for screening and prevention have contributed more to a better outlook for patients. And as a consequence of that, the stigmatization of cancer has been also diminished.

Nowadays, clinical oncology and the basic sciences that support this medical discipline are at the forefront of personalized medicine. In the recently held Personalized Medicine World Congress in Oxford (15–17 April 2015), approximately 80% of the presentations were directly or indirectly related to cancer and oncological activities. So, the question is: is oncol-

ogy a paradigm for psychiatry? I think it is, in spite of the fact that psychopathology and cancer are in many respects different phenomena. The clinical potential of oncology has grown enormously in half a century, and despite the increase in the number of cases (because of smoking, unhealthy living conditions and an ageing population), the clinical–epidemiological results (observed 5-year survival rates) are impressive for different types of cancer. In what ways could oncology be an example for psychiatry? I think that there are five perspectives that are relevant for psychopathology and, respectively, psychiatry. First, oncologists have approached cancer as a developmental disease and have designed, already very early, staging models. This has resulted in better matching of the therapeutic arsenal to disease stages and, perhaps more importantly, to focus on early detection and treatment. Second, oncological researchers focus on systems and the different levels thereof, and are, third, in this context, especially interested in the disentanglement of mechanisms of disease. These mechanisms tell us how a system works, in what way they cause atypical functioning, and what an intervention should be focused on. Fourth, clinical oncologists have been very successful in translational research. The management of the ‘knowledge cycle’, from bench to clinic and so forth – a narrow connection of fundamental and applied research – has yielded a lead. And fifth, this has culminated in the beginning of a new era that of personalized medicine.

Of course, the budgets for clinical and fundamental research for oncology are huge in comparison with those available for psychiatric research. However, some decades ago, oncologists started with small budgets and the expectations of the public that they could be treated effectively were low. Even the word ‘cancer’ was tabooed – the diagnosis of cancer was nearly a death sentence. Although this has changed in various respects, too much optimism is not yet in place. Nevertheless, the clinical progress has created hope for patients and their relatives, has diminished stigmas, has promoted participation and last but not least increased the research budgets.

Based on their own traditions and knowledge base, psychiatrists and researchers in this field can design and follow a similar path in creating better results that can be recognized in epidemiological time series. The way oncologists have made progress should not be copied, but can inspire us. For us, it means the development of a valid and useful classification system that is suitable to form a bridge between research and clinical practice (2) and that looks beyond clusters of symptoms. We need a focus on the search for mechanisms and the potential biomarkers that are related to these mechanisms (3). In coping with the diverse responses to therapies, we can develop tests that check whether a specific intervention (or a combination) does work in a specific case. And for that purpose, it is also wise to analyse the data from already closed trials. Further on, initiatives oriented to new clinical designs [N-of-1-trials (4)], better tools for predicting treatment outcomes, international initiatives for data sharing and experiments for earlier detection and intervention, and even prevention, are highly needed. And more generally, we can, perhaps based on the

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data that are already at our disposal, look for treatment strategies that are stage specific and personalized. One size does not fit all, so treatment protocols and guidelines have to be stratified (5). The future is bright. However, we have to act to make it a reality.

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