Neuroradiology provides personalized medicine today!

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Abstract
This paper discusses the implications of the use of neuroradiological tools for a personalized management of patients.

Keywords
Neuroradiologie, neuroimaging, personalized medicine

As medicine is progressing at great strides these last years, more and more emphasis is put on personalized medicine. Personalized medicine is medicine that is tailored to the individual patient. One area where this has been discussed much is oncology with the potential to develop tumor and even patient-specific treatments. This is an area where neuroradiology, both diagnostic and interventional, has been one of the leading specialties for years and where other specialties may take notice. While not comprehensive, this editorial will address issues such as the diagnosis and treatment of cerebrovascular diseases and also tumors. For cerebrovascular diseases, the main two areas are stroke and aneurysms where we integrate the high technologies of neuroimaging and neurointervention to provide the patient with both a diagnosis and a treatment modality rapidly and safely. In the case of cerebral aneurysms, we are more and more using 3-D data sets acquired either from computed tomography (CT), magnetic resonance imaging (MRI), or digital subtraction angiography to envision the technique we may use with coils, stents, or a combination of both in the single patient; better still we are now able to model stents virtually and place them in the simulated models of the patients vessels and observe the effect of treatment before doing so, and thus adapt the stent placement and even configuration in order to optimize treatment. In acute ischemic stroke, based on imaging findings, especially the length of the clot (on unenhanced CT and computed tomography angiography) as well as the perfusion characteristics, the collateral circulation status, and the presence of extended tissue viability, we can now define areas that are amenable to rescue even beyond the strict therapeutic windows envisioned previously. Finally, when envisioning invasive treatment, be it endovascular or surgical, it will be possible using functional MRI techniques to determine the areas of brain that are close or far from the lesion to treat, and thus provide the referring clinician and the patient with a safe personalized planning procedure for his treatment. While these techniques are not cheap, they can help diminish mortality and morbidity in diseases historically affected with a high morbidity and mortality (aneurysms) or even have a great socioeconomic impact globally since stroke is the third leading cause of morbidity and mortality in the modern world and the leading cause of secondary disability. This shows clearly that the advances made both by forward-thinking researchers, the industry and hard-working clinicians can provide solutions that can have a global societal impact. When we have demonstrated this, can we justify the costs and efforts put into these innovative techniques? And this is clearly the area where neuroradiology has been at the forefront of providing personalized health care for the last decades.

References

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