INNOVATIVE HEADACHE TREATMENTS WILL BE BETTER THAN WHAT WE CURRENTLY HAVE- PRO

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Sumatriptan was a groundbreaking innovation for acute anti migraine therapy. The drug was developed based on the believe that constriction of distended vessels alleviates headache. This substance and sister substances initiated headache research in formerly unknown qualities and quantities and thereby expanded our knowledge on headaches tremendously. However, for more than 20 years a novel class of substances is missing for acute migraine treatment, although our knowledge on migraine and other primary headaches has certainly increased manifold in the same period of time.
It is undisputed that activation of the trigeminal nerve is crucial and a common final pathway to develop headaches independent of various triggers and pathophysiological events in the beginning of a migraine attack. For example, calcitonin gene related peptide (CGRP) has been identified as the crucial neuropeptide of the trigeminal nerve system. Blocking the CGRP receptor successfully aborts acute migraine attacks without any effect on blood vessels. T efficacy of CGRP receptor antagonists in clinical trials was similar to the efficacy of triptans, but adverse events were markedly reduced. Notably side effects attributed to the binding of triptans to the 5-HT_{1B} receptor were not observed in numbers different to placebo. Similar efficacy of drugs devoid of vasoconstriction can be expected based on clinical trials when the CGRP receptor is targeted.
While none of the substances reached the market for various reasons the concept of CGRP antagonism for migraine treatment is still in the focus off drug developing companies albeit in a different way. Monoclonal antibodies against the CGRP receptor or the CGRP peptide have been developed and are currently being tested in clinical trials for migraine prevention.
Clinical research has also led to the differentiation between different types of migraine. At least low frequency episodic migraine and chronic migraine seem to have different underlying pathomechanisms. Sensitization seems to be a crucial element in chronic migraine and at least to my knowledge there is no drug available to date which specifically focuses on sensitization. However, treatment options for chronic migraine prevention already exist and are of substantial benefit for the patient.
Based on our expanding knowledge of migraine new treatment options are developed for different subtypes of migraine (chronic vs. episodic) and are therefore most likely more specific than older treatments. The lack of vasoconstriction is undoubtedly a benefit for migraine subjects with cardiovascular disease who are often not sufficiently treated. Therefore, future drugs will certainly be better with respect to adverse events as drugs with known cardiovascular side effects will not be approved any more for migraine treatment. Treatment effects will also increase due to receptor or mechanism targeted treatments.

In addition to pharmaceuticals a number of different devices is now available for the treatment of certain headache disorders. While deep brain stimulation for headaches is a procedure with a significant risk of harmful adverse events to the patient, peripheral nerve stimulators and external devices with less adverse events are now available. Although these are very often expensive tools, they can provide substantial benefits to the patient, for example in chronic refractory cluster headache or chronic migraine. These devices open new research fields and will lead to other therapeutic targets for novel stimulators and drugs. I believe that our expanding knowledge opens the door to new and better treatment options with a more specific therapeutic approach and with less harmful adverse events of drugs and medical devices. Therefore new headache treatments will be better than established options.