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EDITORIAL

Neuroscience-based nomenclature (jNbN) to replace traditional terminology of psychotropic medications

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Our current terminology regarding psychopharmaca was developed in the last 60 years associated with the development of psychoactive compounds. It includes six indication-based groups, namely antipsychotics, antidepressants, mood stabilizers, stimulants, anxiolytics and hypnotics. Using this classification, very often we run in the uncomfortable situation to prescribe "antidepressants" to treat anxiety disorders or "antipsychotics" in depression. This is confusing for us and especially for the patients and in consequence has the potential to decrease their adherence.

Moreover, from a more theoretical standpoint, those indication terms and associated probably marketing-based terms (like "second generations antipsychotics") do not help the clinician to make informed prescribing, because they do not provide the necessary relevant pharmacological information. For instance, the term "second generation antipsychotic" includes five (five) different types of medications: D2 receptor antagonist (e.g. amisulpride), D2 and 5-HT2 receptor antagonist (e.g. olanzapine) D2, 5-HT1A partial agonist (e.g. aripiprazole) and D2, 5-HT2 and NEα2 receptor antagonist (e.g. clozapine) or D2, 5-HT2 receptor antagonist and NE reuptake inhibitor (e.g. quetiapine).

It is reasonable to expect from a nomenclature to

(a) Be based on contemporary knowledge.
(b) Help clinicians to make informed choices when working out the next "pharmacological step".
(c) Provide a naming system that does not conflict with the use of medications.
(d) Be future oriented, i.e. capable to accommodate new types of compounds.

As none of those four criteria are true for the current nomenclature, five international scientific organizations with focus and expertise in neuropsychopharmacology in 2008 decided to establish a task force with the mission to develop a new system addressing our expectations from a nomenclature. These five organizations are:

ECNP: European College of Neuropsychopharmacology.
ACNP: American College of Neuropsychopharmacology.
AsCNP: Asian College of Neuropsychopharmacology.
CINP: International College of Neuropsychopharmacology.
IUPHAR: International Union of Basic and Clinical Pharmacology.

After intensive and long work, the task force came up with a proposal to create a pharmacologically driven (rather than indication based) nomenclature embedding contemporary neuroscience to understand how medicines act. Among others, 11 pharmacological domains are covered: acetylcholine, ion channels, dopamine, GABA, glutamate, histamine, melatonin, norepinephrine, opioid, serotonin, lithium. In addition, ten modes of actions are included: receptor agonist, receptor antagonist, receptor action, reuptake inhibitor, reuptake inhibitor and releaser, reuptake inhibitor and receptor antagonist, enzyme inhibitor, enzyme interaction, ion channel blocker, positive allosteric modulator. The combination of such terms helps to describe the complex pharmacological characteristics of each individual compound.

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The nomenclature now includes 108 compounds representing the vast majority of psychotropic compounds used worldwide. In order to make it useful for the clinician, NbN also includes four additional dimensions: approved indication, efficacy and side effects, practical notes and neurobiology. *Approved indications* originate from recommendations of the major regulatory bodies (e.g. FDA, EMA, etc.). *Efficacy and side effects* are aimed to highlight situations in which there is evidence to support additional use (for example well-supported expert guidelines). In the side effects section, only prevalent or life-changing side effects are listed. The *practical note* summarizes the clinical knowledge that has been "filtered" though the task force "sieve". Neurobiology is derived from empirical data and divided into preclinical sections, with an emphasis on the latter (NbN website http://nbnomenclature.org/).

The recommended way to use the NbN is via a specific free of cost app that can be downloaded from Google play (https://play.google.com/store/apps/details?id=il.co.inmanage.nbnomenclature), iTunes (https://itunes.apple.com/us/app/nbn-neuroscience-based-nomenclature/id927272449?mt=8) or via the NbN website (http://nbnomenclature.org/authors).

The NbN app includes a sophisticated search engine. It is capable, for example, of combining the indication, pharmacology and side effects. Hence, for example, if we see a patient with a major depressive disorder taking serotonin reuptake inhibitor (SRI) resulting in sexual dysfunction for which reason we would like to switch to another medication, using the NbN app we press "Indication" (depression), adding "Pharmacology" (Norepinephrine) and adding "Side effects" (sexual dysfunction) and the app will inform us about the relevant options. The NbN website includes a glossary helping to "translate" the former nomenclature group terms into the NbN language (http://nbnomenclature.org/authors).

No doubt that this new nomenclature approach will be beneficial for the field. However, the necessary precision requires authors and readers to adjust some beloved habits like speaking in general terms of "anxiolytics", "antidepressants", etc. or apply problematic terms like "second generation antipsychotics" or "atypical antipsychotics". All these terms refer to groups of substances which are in themselves heterogeneous in terms of receptor targets and mode of actions. The use of the new nomenclature will definitely clarify this.

Our journal (EAPCN), along with other international major journals (including Biological Psychiatry, European Neuropsychopharmacology, British Journal of Pharmacology, Clinical Psychopharmacology and Neuroscience, Neuropsychopharmacology, International Journal of Neuropsychopharmacology, World Journal of Biological Psychiatry, CNS Spectrum, European Psychiatry and others), will be among the first to recommend authors (and reviewers) adapting the NbN. The respecting recommendations will be incorporated in the submission package.

There are no experiences how to start the implementation of a new nomenclature in a journal. It might be meaningful for our journal to adopt the procedure of European Neuropsychopharmacology (ENP). ENP requires authors to define their usage of a term such as "antipsychotics" referring to NbN at the time when it appears in the main text of the paper the first time. Furthermore, to make all papers searchable by NbN, the NbN nomenclature of the compounds that the papers cover has to be added to the keywords of the paper.

It will take some time and efforts on all sides (authors, readers, reviewers, editors, etc.) to adapt to the new nomenclature, but in the view of the editors this seems to be worthwhile considering the future benefit for our field.