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Editorial

Neuroscience-based Nomenclature: What is it, why is it needed, and what comes next?

THE CURRENT CLASSIFICATION system of psychotropic drugs was first published in 1976 by the World Health Organization (WHO) Collaborating Centre for Drug Statistics Methodology and has long been familiarized as the WHO Anatomical Therapeutic Chemical (ATC) nomenclature. In the ATC system, drugs are classified according to the anatomical location where they exert effects. Taking aripiprazole as an example, drugs used for psychiatric practice are classified under the nervous system as the anatomical category (Code N). Subsequent subdivisions are defined according to broad indications. 'Psycholeptics' (Code N05) include 'antipsychotics' (N05A), 'anxiolytics' (N05B), and 'hypnotics and sedatives' (N05C). 'Antipsychotics' consist of 10 kinds of antipsychotic medications and, surprisingly, lithium. Aripiprazole (N05AX12) is sorted to the category of 'other antipsychotics' (N05AX) along with eight other antipsychotics, including risperidone and zotepine, despite the fact that they are quite different in drug profiles. Thus, up-to-date scientific knowledge on antipsychotic drugs has not been reflected in the current WHO ATC nomenclature.

Moreover, while the WHO ATC nomenclature is partially based on clinical indications, boundaries among various categories of psychotropic drugs, using the current nomenclature, are becoming less and less clear. 'Antidepressants' (N06A) and 'anxiolytics' (N05B) are good examples; antidepressants are used not only for depression but also for anxiety disorders. This is also true for antipsychotics, some of which have actually been indicated for bipolar disorder and treatment-resistant depression. This discrepancy between their terminologies and indications often confuses patients and their caregivers, which may lead to a misunderstanding of the intrinsic biological effects of prescribed medications. In addition, new categories, such as multi-acting receptor targeted antipsychotic (MARTA) and noradrenergic and specific serotonergic antidepressant (NaSSA), have sometimes been proposed by pharmaceutical companies. However, those terms are not always defined based on robust scientific evidence in a systematic manner, but sometimes arbitrarily selected for sales purposes.

To overcome these issues, following an initiative of the European College of Neuropsychopharmacology (ECNP), a taskforce for new psychotropic nomenclature was established with representatives from five international organizations: the ECNP, the Asian College of Neuropsychopharmacology (AsCNP), the American College of Neuropsychopharmacology (ACNP), the International College of Neuropsychopharmacology (CINP), and the International Union of Basic and Clinical Pharmacology (IUPHAR). This taskforce has tried to provide a pharmacologically driven, rather than indication-based, nomenclature that embeds contemporary scientific evidence of how medicines take effect, in order to help clinicians to make informed choices when they determine what would be the next 'pharmacological step,' and to decrease stigma and enhance adherence with the usage of terminology that better illustrates the rationale for selecting a specific psychotropic agent.[1,2] The Neuroscience-based Nomenclature (NbN) provides a pharmacologically driven nomenclature focusing on pharmacology and mode of action, which mirrors current knowledge and understanding of the targeted neurotransmitters, molecules, systems being modified, and mechanisms of action.[3] For example, olanzapine is called a 'D2, 5-HT2 receptor antagonist.' Mirtazapine is not an 'NaSSA,' but a 'norepinephrine α2, 5-HT2, 5-HT3 receptor antagonist.'

The newest version of the NbN includes 130 psychotropic drugs, and it is now being translated into Japanese, Spanish, Korean, Chinese, and Russian. Moreover, the NbN for psychotropic drugs used for children and adolescents (i.e., the NbN C&A) is now also available. The easiest and recommended way to access the newest version of the NbN is to use the approved app, which is freely available on the project's website (http://nbnomenclature.org/). More

than 20 academic journals have published or will publish editorials featuring the NbN (for example, references[4–6]) and some of them have already included it in their authors' guidelines. This movement will likely continue and probably accelerate in the near future.

The NbN project has just started. There are still several issues to be tackled and solved. First, drug approvals by regulatory bodies and insurance reimbursements may not be ready to make timely changes. Therefore, it may need endorsement from international regulatory bodies, such as the WHO. Second, lack of sufficient evidence on mechanisms of action for many psychotropic drugs has to be acknowledged, although this problem is not only the case for the NbN, but also for the field of psychopharmacology. This nomenclature aims to reflect the current pharmacological knowledge base and cannot necessarily represent the ultimate scientific truth. The taskforce believes that it is better to present a cutting-edge scientific interpretation than to wait for the definitive conclusion.[1,2] Lastly, but most importantly, the NbN has to be welcomed by the scientific community; it needs to be accepted and widely used in clinical and research settings.

The terminology of the field will not be altered immediately; it will require some time to see if the NbN will actually permeate the scientific community and gain acceptance. Notwithstanding a number of limitations (or challenges) as discussed above, this bold initiative is expected to contribute to better classification and understanding of psychotropic drugs, which will be useful in clinical as well as research settings.

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Hiroyuki Uchida, MD, PhD [1,2]
[1]*Department of Neuropsychiatry, Keio University School of Medicine, Tokyo, Japan, and* [2]*Neuroscience-based Nomenclature Taskforce*