

Commentary

Linguistic malady in medical literature: the horrible homonyms

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ABSTRACT

As a medical student for 10 years, and then as a teacher for 25 years-the author has found and felt the semantic confusions (i.e. ambiguity about words and their meanings) in medical students/literature widespread. It is a commentary-correlating confusing realities from various standard sources of scientific medical literature. Suggesting some approaches for improvement.

Keywords: Homonym, Homophone, Homograph, Medical literature, Disambiguation

INTRODUCTION

Semantics (i.e. the science of word versus meaning) is overlooked during training as a medical student and/or as a medical teacher. As a seasoned teacher, repeated clarifications are ingrained enough to obviate any confusion. But as a student, if we recall our own classroom experiences/ written exam time ambiguities/ viva time confusions, or our current students' learning performance (from classes to examinations), the problems is immense.

Coming to the notion of 'homonym'-its definition itself is a bit intricate. There are 3 connotations for this single word.¹

In literature, spring (noun; the season between winter and summer) and spring (verb; to jump abruptly) are homonyms (same spelling as well as pronunciation, but different meanings). Medically, Duchenne disease means 1. spinal muscular atrophy. 2. bulbar paralysis of lower cranial nerves. 3. Tabes dorsalis. 4. Widespread muscular dystrophy mostly in adolescent males.²

To, too and two are homonyms (same pronunciation only-otherwise, spelling and meaning both differ; they are sometimes separated as a new entity called homophones).

Homophones can be inflection forms (grammatical derivatives of same word origin like just next example).

Mucous (adjective; e.g. 'mucous' secretion keeps buccal cavity wet) versus mucus (noun; e.g. the secretion contains 'mucus' and digestive enzymes), or miosis (constriction of pupil in the eye) versus meiosis (a cell division causing half number of chromosomes in gametocytes like sperm and ovum), are some medically relevant examples.²

Wind (pronunciation wind; =slow moving air) and wind (pronunciation wāind;=to tighten by coiling) are homonyms (only same spelling; sometimes separated as a new entity called homograph).¹

Instead, for medical students, esp. undergraduates, LASA (look alike sound alike) words, which are nearby homophone, are more relevant. Alongside nauseous (related to nausea) versus noxious (harmful); affect (verb) versus effect (noun) and advise (verb) versus advice (noun) from common parlance English can also be confused and clarified.

As Indians are not very punctual about English pronunciation, ethanol versus ethanoh or ionotropic (receptor type;=ligand gated ion channels) versus inotropic (cardiac contractile force related; analogous to

chronotropic/ dromotropic/ bathmotropic/ lusitropic effects) can also be confusing.²

In Indian system of Ayurveda, कफ, वात and पित्त are known body humors since ancient times, and accordingly, if someone tries to expectorate sputum, people say that कफ is coming out. This कफ (sputum) is confused as ‘cough’ (which is not the material output, but is the reflex of expectoration.)

Linguistically such words are called ‘false friend’-they are exactly same in pronunciation but in different languages mean very differently (semantically, a homophone across different languages). For MBBS (Indian Medical Undergraduate) students, covering more than 20 subjects in less than 60 months, these problems are a bit too much to resolve all by their own.

The MBBS students easily differentiate between nimodipine versus nitrendipine (or salbutamol versus salmeterol) because both are contextually nearby on the same page of calcium channel blockers (or antiasthmatic β -agonists) but they confuse between antiamebic metronidazole and antihelminthic mebendazole because both are several chapters apart.

Generic names of sulphonamide combination ‘cotrimoxazole’ versus antifungal ‘clotrimazole’ or trade names ‘Voveran’ containing NSAID diclofenac sodium versus ‘Vacuron’ containing skeletal muscle relaxant vecuronium are similarly confusing LASA words for MBBS students.

Similarly, students confuse between flunarizine (calcium channel blocker used as antimigraine drug) and cinnarizine (second generation H₁ antihistaminic antiallergic). Antithyroid carbimazol and antiepileptic carbamazepine are also confused-though similarity is still less.

Analogous confusion arises between antiviral -virs (antiretroviral protease inhibitors) versus-mivirs (antiinfluenza agents) versus-cyclovirs (antiherpes drugs) versus -gravirs (integrase inhibitors) just because of similar sounding suffixes.

Coming back to the terminology of homonymy, notion 1- thus the word itself has 3 homonyms.¹ Loose usage of a given word in the common parlance leads to multiple meanings of a given word. Just like rivers getting wider and dirtier downstream, further confusion of meanings of a homonym also arises in usage-because same terminology is used in unwarranted wider sense.

As we are not sure about all possible synonyms (word equivalents with same meaning), we are also unsure about all homonyms (all the possible meanings of a given word). As AI searches for words but fails to correlate terminology with context around, won’t these homonymous ambiguities make our reviews of literature murkier?

Moreover, analogous to literature, even in science, redefining the same word can add an altogether different meaning-leading to conceptually different homonyms. For example, ‘superinfection’ in pharmacology means opportunistic infection following loss of normal gut flora (and thus removal of competitive inhibition) after oral treatment with wide spectrum antibiotics.³

But the same word ‘superinfection’ in immunology means “opportunistic infection following loss of natural immune cells in the blood after cytolytic immuno-suppressant or antineoplastic therapy”; and in medicine it means “an infection over already broken cutaneous barrier e.g. bacterial infection on flea bite site” or “bacterial superinfection of tinea pedis/.”⁴⁻⁶

That’s why superinfection must be clearly categorised as (1) infection-treatment-infection or (2) immunity deficit-infection or (3) barrier breach infection or (4) infection facilitated/ associated infection. This contextual clarity, if standardised universally, can be a great help in the online reviews.

Delving deeper into the concept of homonymy, even in the single subject of pharmacology, ‘tachyphylaxis’ is differently defined by different standard textbooks: Acute tolerance seen in the cases of doses repeated in quick succession (e.g. by indirectly acting sympathomimetic tyramine), desensitization on continuous administration of hydralazine/ nitrate/ salmeterol or calcitonin or desmopressin desensitization over several days due to depletion of factor VIII and von Willebrand factor or chronic tolerance after pegvisomant therapy, due to development of antibodies against growth hormone receptor antagonist or to summarise, it is categorically stated that tachyphylaxis is synonymous to desensitization or strong tolerance.⁷⁻¹³

Surfing through medical literature, we witness tachyphylaxis as a decremental pharmacodynamic effect that occurs with repeated administration of drugs over minutes, hours, days, weeks or even months! Then what is the rationale of word origin from the Greek lexeme ‘tachys’ meaning rapid?¹⁴

If the 5th point above is ok, then why the hell this neologism of ‘tachyphylaxis’ befell on medical academics? Isn’t it overloading our glossary for no innovation in concept? Other than adding unnecessary vocabulary burden, it also increases our workload during the review of literature.

SUGGESTED REMEDIAL MEASURES

At the grass root level, in any medical/clinical subject and any class-nesting of confusing words/ ideas and their clarification by compare and/or contrast should be mandated (like communication skill or biomedical ethics-under a separate heading of disambiguation) as a moral responsibility in any teaching-learning session.

Like internal validity and external validity of study design, any medical subject expert would enlist such confusing words on two fronts. Firstly, for clarification within the subject (like cotrimoxazole versus clotrimazole in pharmacology) and secondly, among various medical subjects (like definition of superinfection in pharmacology versus immunology versus medicine).

And till all such confusions are finally disambiguated, medical teachers must document and report dedicated effort to disambiguate through nesting (within specified subject topics), horizontal integration and vertical integration (across subject)-to be made mandatory by NMC through RBC/ CISP/ ACME.

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