SHORT COMMUNICATION

Clinical Diagnostic Reasoning in Primary Care

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ABSTRACT

Clinical medicine needs continuously updated information, skills, and attitude to change constantly for enormous medical advances. For an accurate diagnosis, the physician needs to practice proper clinical reasoning to have appropriate management. Diagnostic limits are often indistinct and need a multi-stage process that requires proper data collection, the formulation of an illness script, and testing the diagnostic hypothesis. Physicians may be used any diagnostic approach for clinical reasoning, enriched by accumulated experience and critical analytic thinking. Intuitive thinking and constant critical thinking are more typical of skilled physicians regarding diagnostic reasoning.

Key words: Clinical reasoning, diagnosis, internal medicine, primary care, the diagnostic process

INTRODUCTION

Reasoning is the process of using current knowledge to conclude, predict, or construct explanations. At the same time, clinical reasoning can be defined as a physician explaining a patient's symptoms and signs in combination with the prior physician's knowledge and previous skills. It is a continuous process that doesn't finish when the diagnosis has been made.[1] Clinical diagnosis is the most probable disease identification of the underlying patient's complaints, based on the patient's present history and physician's examination rather than the use of any laboratory examination or medical imaging. Clinical reasoning is an acquired core competency expected to be present in working physicians.[1]

A physician's ability to have a proper diagnostic process is vital for appropriate treatment and enhancing prognosis. The medical college taught students a sequential approach in history taking and examination to have a broad differential diagnosis. However, it is seldom done in reality; the physician makes early diagnostic hypotheses at an initial stage of the consultation, then guided by successive history and examination; it is a progression of hypothetico-deductive reasoning.[2] However, physicians' strategies to arrive at a proper diagnosis, by using three stages which are the initiation of diagnostic hypotheses, refinement of the hypotheses, and defining the final diagnosis.[2]

So the clinical diagnostic reasoning is a process by which physicians collect, combine, and interpret the patient's information to cultivate an action plan, create a story from the patient's history, to enhance knowledge acquisition and storage through repeated exposure to real case examples.[3]

Diagnostic strategies differ in hospital care from primary services and from novice to expert physicians. Physicians should consider a clinical sign plus diagnostic test's positive or negative predictive value, and the prevalence/ incidence rate which a different weight in primary care medicine than in a hospital setting.

Moreover, severe disease occurs less frequently in general

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practice than in hospitals because different patients interpret the seriousness of disease complaints. In primary care, the physicians used knowledge on the patient's history and joint disease community-based. Primary care physicians used low-technology, step-by-step strategies, including watchful waiting, presumptive symptomatic hypothetic-deductive strategy, laborious inductive strategy, probabilistic reasoning, pattern recognition trigger, self-labeling diagnosis, spot diagnosis, self-explanation approach, and algorithm strategy.[3-5]

Self-labeling diagnosis means patients attend healthcare services and have ideas about their diagnosis. So, perceived their diagnosis affected by prevalence rate, previous history of same episodes and general awareness of the condition. Self-diagnosis should always undergo subsequent refinement and continuous challenge.[6]

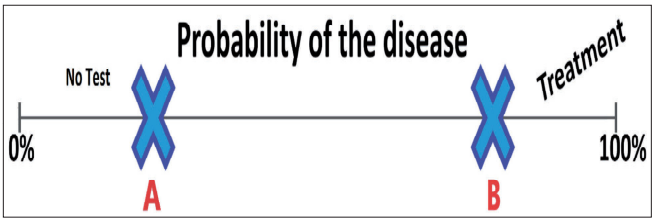
While spot diagnosis can be used by using one or more human senses which do not require further history from patient; such as the use of visual sense in acne, use of auditory sense in barking cough, use of smell sense of acetone in diabetic ketoacidosis, use of touching sensation in scarlet fever (Sand-paper).[2]

Whereas hypothetic-deductive reasoning is the physician's ability to think logically, formulate hypotheses based on existing scientific theories. The hypothetic-deductive method is a proposed scientific inquiry that proceeds by formulating a hypothesis after the patient's chief complaint in a form that can be falsifiable, using a test on observable data where the outcome is not yet known. It starts with general principles, assumptions, ideas and works from them to more particular statements. The predictions are then tested by gathering and analyzing data, and the theory is then either supported or refuted by the results.[7] Using the hypothetic-deductive method as 'serial-cue' approach places much value on the physician's development of the diagnostic competence.[7]

However, physicians in probabilistic diagnostic-reasoning will use additional tests or further examinations which required to rule in or rule out a diagnosis (e.g., feeling of the temporal artery in suspected temporal arteritis, using urine dipstick in suspected urinary tract infection, and order electrocardiograms in suspected myocardial infarction).[8]

Nevertheless, pattern recognition triggers are refinement strategies for many signs, symptoms and compare them with usual previous pattern or cases.[2] It is the modification strategy most commonly relies on the memory of the same pattern.[2]They used scoring scale for common clinical prediction rule,

The standard form of pattern recognition is using widely validated instruments (e.g., Ottawa ankle rules, streptococcal sore throat rules, ABCD score for stroke risk, HAD score for depression, Wells rule for deep vein thrombosis, and chest infection rules).[9-12] Although, probabilistic strategies are used to test then to initiate treatment thresholds. Suppose the probability of the disease is very low. so no need to do a test. while, if the probability of the disease is high. the treatment threshold will be increase in parallel (treatment threshold).



The estimation of pre-test probability comes from three interrelated factors; direct studies on disease probability by validated clinical prediction rules (e.g., Wells score) and clinical experience and judgment (Guess estimation). The benefit of doing pre-test probability is either to rule in or rule out a disease. From there comes the importance of knowing the sensitivity or specificity of the test. When physicians want to rule in a disease, use a specific test.When physicians need to rule out disease, use a sensitive test. If the sensitive test is negative, it rules out disease in a low-risk patient.[13]

When physicians want to calculate how many times the test found disease, compared to non diseased people by using likelihood ratio (LR). Calculation of the (+LR) is the measurement of sensitivity/1-specificity. While the calculation of the (-LR) is the measurement of 1-sensitivity/specificity.[13]

$$\textbf{LR=}\ \frac{\text{Probability of a patient } \textit{with} \text{ the condition had the test result}}{\text{Probability of a patient } \textit{without} \text{ the condition had the same test result}}$$

$$\textbf{+LR=}\ \frac{\text{Sensitivity}}{\text{1- Specificity}}$$

$$\textbf{-LR=}\ \frac{\text{1- Sensitivity}}{\text{Specificity}}$$

When physicians need to rule in disease, use the largest +LR.

When physicians need to rule out disease, use the smallest -LR. When a physician orders a test for a patient, the test result either increases or decreases the probability of the disease (post-test probability).[13]

The role of any testing is either to rule in a diagnosis (The goal is the patient has the disease) or rule out a diagnosis (The goal is that the patient does not have the disease).

The physician is working in primary care with a low prevalence of uncommon and severe diseases; the goal is to identify patients without disease by using a test of high negative predictive value (NPVs) and low positive predictive value (PPVs).[3]

Primary care physicians mostly use a watchful waiting strategy to filtrate most mild, self-limiting diseases from minor to severe diseases. Watchful waiting strategy is cheap, time-efficiency principle, it preserve resource from unnecessary additional testing, lower health service costs, and adjudicator-discriminating between majority with self-limiting illness and minority with severe disease.[14]

CONCLUSION

Patients presented with problems in primary care are different from patients presented with problems in secondary care. Most patients attend primary care because of easy access with the self-limiting disease. The main job of primary care is to grasp the red flag of severe disease and reassure the anxious patients. Primary care physicians should be willing to tolerate uncertainty, and patients should accept watchful waiting approaches because they trust their physicians. Primary care physicians should not rush to do the test unless to diagnose either common or severe disease.

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