Medical errors may be the third-leading cause of death in US [1]. Diagnostic error is a type of medical error that causes wrong or mistaken diagnosis of the patient's condition. According to a recent study published in BMJ Quality and Safety, approximately 12 million adults who seek medical care are misdiagnosed and nearly half of the misdiagnosed cases have the potential to cause serious harm to the patient [2,3]. Cancer has been by far the most misdiagnosed disease [4,5]. Many studies attribute this to the doctors failing to stick to the cancer screening guidelines, especially in the absence of typical etiological symptoms [6]. So how does the physician diagnose the real cause of the problem? Even if a physician decides to go above and beyond in determining the root cause, time and lack of clear information may be one of the limiting unavoidable factors among many. Under those circumstances, is it justifiable to put patient's life at risk based on the choices made by Physician? At what point does a physician put an end to the search game and stand firmly with his or her conclusions? The answers to these questions are not in the black and white but ply somewhere in the grey zone. This editorial aims to understand some of the causes of misdiagnosis errors and lessons learned through case studies.

Are We Asking The Right Questions?

Often times, an existing illness “overshadows” and leads to the under diagnosis of other co-morbidities, which is known as “diagnostic overshadowing” [7]. Therefore, in addition to gathering patients’ “critical” medical history, formulating an appropriate set of diagnostic hypotheses, and selecting the right questions to test them is the key for achieving diagnostic acumen. For example:

“A healthy male in his 50’s displayed the unusual combination of symptoms seizure, lightheadedness, and low blood pressure. The consulting neurologist ordered an immediate CAT scan for the chest, which showed a major tear of his aortic artery. After careful diagnosis the neurologist immediately called upon the cardiovascular surgeon. The patient was on the operating table getting his blood vessel repaired within the next 30 minutes. And his life was saved”.

Aortic dissection was his final medical diagnosis. It is almost always fatal without timely treatment. Normally, aortic dissection causes pain in the chest and you only think about this medical diagnosis when someone is presenting with a symptom of chest pain. In this case the patient did not have any chest pain at all. It was probably because he almost collapsed before he could feel the pain. As the tear extended all the way to his brain arteries, he collapsed and had some seizure like activity. His blood pressure was low as the blood supply to his whole body was compromised [8]. The accurate diagnosis and prompt therapeutic approach was possible because of strategic collection of the critical information and asking the right questions.

Are We Screening Too Much for Disease?

Over the past decade, the use of medical tests, especially diagnostic imaging have increased by 5% to 10% annually [9]. In modern medicine, screening tests are gaining increasing importance in saving lives by early diagnosis and tremendously help reduce suffering if applied properly. There are many factors that determine the accuracy of a specific test, and a false positive outcome form a test will cause more harm than good to the patient [10]. Thus, it is so important that the regulations are imposed on these diagnostic tests.

“For a 42 year old lady, the first routine mammography results signaled strong suspicion of cancer. However, the biopsy results showed no trace of cancer. Although relieved, the lady underwent many emotional phases and stress during the time between the 2 results. The counter effect of this situation prompted the lady to vow for not having another mammogram until she was 50.”

Mammograms had been proven to be incredibly useful in screening women with potential risk of breast cancer. However, it was shown through multiple studies that the periodic mammograms in women (age less than 50) cumulatively increases the risk of false positive result [11,12]. Therefore, in November 2009 when the U.S. Preventive Services Task Force recommended that routine screening mammograms for women with an average risk of breast cancer should start at age 50 instead of age 40. With diagnostic tests, it becomes imperative to find the right balance based on accurate data, a proper understanding of the risks and benefits and a recognition of the real differences between patients in their tolerance of such risks.

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Physicians Neglect

Misdiagnosis can be due to various reasons: physician overconfidence or complacency, insufficient time with a patient, unreliable detection tools, and poor pathology protocols, knowledge limited by over- or under-specialization, fragmented informational systems, and patient inattention or repression. But regardless of the cause, the results can be catastrophic [13].

"A lady, at the age 45 was an active athlete. She dismissed the subtle warning signs from her body for several months. Bloating, satiety, fatigue and constipation are often attributed to menopause, aging, indigestion, irritable bowel syndrome, depression, laziness or whining. A year later, she was diagnosed of cancer which due to ignorance had progressed to an advanced stage that is treatable but not curable. She misinterpreted the muted symptoms of ovarian cancer" [14].

Misdiagnosis can result in devastating surgical blunders, too.

"Another lady, underwent surgery for what her doctor assumed was a benign ovarian cyst, which he removed. He saw a suspicious area on the second ovary and — without waiting for the pathology report of the frozen section — cut into it. It turned out the lesion was cancerous and, by slicing into it, he had released cancer cells into her body. A senior surgeon stepped in and successfully completed a much larger operation than had been planned, then insisted that the first surgeon tell what had happened. The patient was horrified by the first doctor's "huge mistake," which "increased the risk of recurrence dramatically." But the honesty of both doctors allowed her "to keep a sense of trust in them"[15].

Many doctors who make a misdiagnosis are unaware that they have made a misdiagnosis because of the fear of wrong impression or because patients could not find out until years later. A recent study on the Veterans Administration hospital system in Texas estimated that there are at least 500,000 missed diagnostic opportunities that occur out of the 500 million primary care visits, occurring annually in the United States. A survey found that 96 percent of physicians felt that diagnostic errors are preventable while half said they encountered at least one per month. Despite these statistics, many doctors are reluctant to report diagnostic errors to avoid entailing issues, even anonymously. This increases the likelihood of moderate to severe harm on the patient [16]. A patient should exercise all caution with his or her health and try to seek answers in case of suspecting misdiagnosis by the physician.

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