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Editorial

Diagnosis: Identification of Problems or Problems in Identification?

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Clinical decision making involves a complex inter-linked process of using procedures, tests and methods along specific strategies according to the healthcare setting and delivery system (Buckingham and Adams, 2000). This editorial is aimed to explain the seemingly similar and related but yet different terms on diagnosis with implications for clinical decision making in medical and health sciences practice.

Medical Diagnosis

Identification of illness according to the description in the field of Medical practice which is usually performed by a physician (Jacob, 2015). The terminology might range from specific named diseases to syndromes and they are listed in International Classification of Diseases (ICD-10) (Kealey and Howie, 2013). It involves a judicious combination of clinical, laboratory and radiological diagnosis, and in some cases, surgical (Stanley and Campos, 2013).

Clinical Diagnosis

identification of illness depending upon presenting symptoms (reported by patients) and signs (examined by clinicians) usually performed by any healthcare professional (Woods et al, 2005). It is also termed as bedside diagnosis since the clinician uses only his/her own examination skills of history-taking, subjective examination and objective examination in order to identify the problem. Clinical diagnosis depends upon the clinician's skill and it is not considered as a 'stand-alone' choice for diagnosis due to its subjectivity and poor inter-examiner reproducibility (Wong et al, 2003). Hence, it could be aptly termed also as subjective diagnosis.

Laboratory Diagnosis

Identification of illness depending upon analysis of body fluids, structure and function of body parts, and various systems using sophisticated tools and technology-based assessments constitutes laboratory diagnosis which are performed by Microbiologists, Biochemists and Pathologists (Cornett and Kirn, 2013). It involves blood tests, sputum tests, pulmonary function tests, Electrocardiography, electro-encephalography, electromyography, nerve conduction studies, urine analysis, synovial fluid analysis, biopsy, movement analysis systems, and exercise tolerance testing.

Surgical Diagnosis

Identification of illness by invasive procedures after administration of anaesthesia which are usually performed in a highly sterile environment by a surgeon (Nixon et al, 2014). It involves some methods such as biopsy, bronchoscopy, endoscopy, laporoscopy and arthroscopy. It is performed as a pre-operative diagnostic strategy for identifying minor lesions/ abnormalities in minimally invasive surgeries (Del Guercio et al, 1985).

Radiological Diagnosis

Identification of illness by exposure of body part to

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electromagnetic radiation and obtaining electronically generated images which are performed by a radiologist. Procedures such as plain radiography (X-ray), computed tomography, magnetic resonance imaging (MRI), and ultrasonography are some of the commonly used tools. Other derived methods such as angiography, arthrography, bronchography, echocardiography, positron emission tomography, radionucleide bone scans, and functional MRI are also used (Melo et al, 2011). Although radiological diagnosis is often gold standard diagnostic tool and is considered in many of established diagnostic criteria, the findings warrant clinical correlation in most of the situations (Sutheland, 1970).

Functional Diagnosis

The paradigm shift from biomedical model to a behavioural model essentiated a functional diagnosis model depending upon a continuum of impairment, disability and handicap into a further comprehensive body structure and function, activity limitation, and participation restriction along the International Classification of Functioning, Disability and Health (ICFDH) (Dekker, 1995). This model is best suited for activity-based rehabilitation approach targeted towards quality of life rather than a symptom-based or impairment-based treatments (Berg et al, 1998).

Case Example

A 55-year old known type-2 diabetic male adult, presented with sudden onset of sensory and motor complaints in both upper and lower limbs to an out-patient department.

Clinician: did you sustain any injury or fall or accident? (to rule out traumatic etiology)

Patient: yes.. a fall on the head but no wounds or infections as such..

Clinician: ("preliminary diagnosis of diabetic peripheral neuropathy"), I would suggest you take an MRI for cervical spine (to rule out traumatic spinal cord injury and quadriplegia)

Patient: MRI is normal..

Clinician: did you have loss of consciousness or ENT bleed after the fall?

Patient: yes..a little through my nose but now it's okay. Occasionally though I have headache, nausea, vomiting and dizziness.

Clinician: I suggest you take a CT of the brain (to rule out traumatic brain injury)

Patient: CT scan is normal.

Clinician: "a fall after loss of consciousness or loss of consciousness after a fall?" (former- neurologist referral and latter- neurosurgeon referral)

I will now examine you, please lie down on the plinth. (working diagnosis of peripheral neuropathy based upon symmetrical sensorimotor deficits in vibration and light touch, and lower motor neurone features of diminished muscle strength and deep tendon reflexes)

Patient: what has happened to me, please explain..

Clinician: you have problem in nerves and/or muscles of both arms and legs, for which I would suggest laboratory testing using EMG and NCS.

Patient: EMG is abnormal with decremental response (muscular dystrophy- unrelated to trauma), and NCS is abnormal with prolonged latencies and reduced conduction velocities (neuropathy- unrelated to trauma). Yes doctor, my NCS is abnormal.

Clinician: it may be axonal or demyelinating (among many subtypes of peripheral neuropathies) or mixed neuropathies, and hence I suggest laboratory testing such as nerve biopsy and blood tests (for ruling out differential diagnoses).

Patient: reports say I have diabetic peripheral neuropathy, doctor.

Clinician: yes, you have so (may be a final diagnosis). But to check out your visual function (to rule out co-existing retinopathy), or renal function (for ruling out nephropathy), may I suggest further testing? Or cerebral angiography (macrovascular complication of diabetes mellitus)?

Patient: I don't have any problem in my vision or in my urination, why do I need those tests? Yes, I will take cerebral angiography since I have headaches…but first I would try some treatment and if not responsive, we'll test further..

Clinician: yes, you are absolutely right. Kindly visit our multidisciplinary treatment centre for a comprehensive biopsychosocial management for your problem.

Discussion

Whilst clinical diagnosis is the most ancient form, and highly skilful for the practitioner, it has its own limitations and pitfalls of poor reliability. Its validity and diagnostic accuracy was studied in conjunction with laboratory or radiological diagnosis as a gold standard tool for criterion-related validity.

Clinical diagnosis is valuable in limited resource settings and for primary care practice (Ramos-Rincon et al, 2015). *Preliminary diagnosis* is often made depending upon past history (Danford et al, 2000) and *working diagnosis* if made from hypotheses generation throughout the history-taking and subjective examination in order to select suitable objective examination tests (Christie et al, 2016).

At the end of a complete clinical examination, a *provisional diagnosis* could be arrived at (indicated often with a query prefix) (Richards et al, 2000). Laboratory diagnosis is best suited to identify *differential diagnosis* to delineate related disease conditions and disease staging (Mast et al, 2013). A successful combination of clinical, laboratory and radiological diagnosis with all 'features fit' situation leads to a *final diagnosis*.

However no diagnosis is final, the take-home message is diagnosis is a dynamic term and it evolves continuously since human beings and body parts are so inherently interdependent upon each other structurally and functionally and any further clinical manifestation would modify the existing diagnosis on a day-to-day basis in clinical practice. Such a case-based reasoning process is essential to provide individualized patient-centered care (Park, 2014).

The above illustrated case example demonstrated a shared informed collaborative decision-making between clinician and patient through an ongoing communication process and parallel critical reflective clinical reasoning. In most of the situations, in resource-poor settings, preliminary diagnosis becomes a shortcut to diagnosis and then treatments are often initiated (at patient's own risk) to evolve an ongoing 'treatment-based diagnosis' (Stanton et al, 2011).

An open-minded attitude to diagnosis is essential to identify mixed, atypical or combined presentations in order to best individualize the treatment for patient-specific goals. Such a patient-centered care is essential for moral, ethical and legal execution of evidence-informed healthcare practice.

Disclosures

The conceptualization of this article was developed from a healthy argument between the three authors depending upon their own professional expertise and experience (SPK- 13 years, CK- 9 years and SKE- 7 years), and it does not provide a decision-making guideline for others per se.

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