

What Doctors Must Learn Volume 4

Power of observation



*you see but not observe
Sherlock Holmes –*

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Sherlock Holmes – you see but not observe

Preface

The power of observation is often undervalued and underutilised in the scheme of physical examination. Observation is beyond mere seeing. We are endowed by nature to observe. However, it is said, “what mind does not know, eyes cannot see”. So, we need to train our mind to observe, the combination of critical thinking and vision. The power of observation can be extended to listening to sounds, not just hearing. (Listening is different than hearing, the same way as observation is different than seeing). One may be surprised to find what all can be assessed before touching the patient, that is the power of observation. Time spent for observation is worth and with repeated practice, it does not take time as it becomes a habit. The following chapters discuss the power of observation to help in the diagnosis of diseases of different systems and emphasise its importance in clinical practice.

Introduction

Observation refers to the ability to notice minute and significant details. Many a time, we see what is more obvious and what we expect to see but not what actually exists. Thus, we may miss some important clues. Observation helps us to see unexpected things. We must learn to focus outwards beyond what is striking to the eye. It is an important part of the physical examination, the medical diagnostic process, next only to the detailed history.

How to develop observational skills?

Observation can be formal (planned) or informal (spontaneous). Physical examination starts with an inspection. Medical students are taught standard patterns of inspection as a part of general examination and examination of various systems. Beyond this formal approach, one must develop an eye for informal or spontaneous observation. Observational skills are developed by repeated mindful practice that makes us see beyond what two eyes can see, as if with the third eye – committed mind and critical thinking. Analysis of detailed history can prompt us to focus our observation on minute details. A role model teacher can sensitise a student to develop such skills. Of course, it is never too late, one can learn it through repeated practice.

Observation to assess “seriousness”

A mere look at the patient can alert us about something going wrong. A change in behavior of the patient often is the first clue to impending trouble. A patient suffering from high fever for the last 12 hours, looked confused with irrelevant talking. It was enough to suspect encephalopathy – the affection of the cerebral cortex. It could be either due to poor perfusion or oxygenation of the brain. Immediate intervention would need IV fluids and administration of oxygen. This patient was confirmed to be suffering from meningococemia leading to circulatory collapse and could be saved because of astute observation. If the change in behavior in such a patient is missed, it could be fatal in the next 24 hours. So important is to note any change in behavior. No test can substitute such an observation.

A patient was operated for acute appendicitis and was noticed to be lethargic on postoperative day 3. There was no fever and the abdomen was soft without any guarding or tenderness. This patient was confirmed to be in early compensated septic shock due to infection. There are many such examples where observation saved the day. ABC – airway, breathing, circulation – can be assessed by observation in a few seconds. One must confirm patent airway. The obstructed airway is

evident by gurgling sounds in the throat suggesting the pooling of secretions Hissing nasal sound indicates obstructed nasal passage, inspiratory stridor and subcostal retraction evidence of upper airway inspiratory obstruction, wheeze with subcostal retraction suggests lower airway expiratory obstruction while grunting denotes probable pneumonia. Fast respiratory rate and depth of respiratory movements are easy to note. Mild tachypnoea can warn impending respiratory failure, cyanosis being too late a sign. Deep and rapid breathing suggests acidosis. Circulatory status can be assessed by peripheral parts of the body being pale and cold. Such findings can be further confirmed by tachycardia, low blood pressure and increased capillary refill time.

Other facts such as hemorrhagic or gangrenous skin rash, greyish-white membrane over a tonsil (probable diphtheria) and abdominal distension are other observable findings that may need immediate further assessment. Sudden excessive sweating may suggest autonomic disturbance due to sudden severe insults such as hypoglycemia or myocardial infarct.

Thus, irrespective of what the patient presents to us, it is necessary to assess “seriousness” if any, before embarking on history and physical examination. It does not take more than half a minute to do so.

Observation at the “first look”

We must try to differentiate between acute sickness (short duration illness), chronic sickness (progressive long duration illness) or comfortable status (not affecting health in spite of symptoms). Nutritional status, growth (weight, height) and development (mental status), general body stature, posture and head-to-toe abnormalities and skin rash are other findings easily evident on observation. One can also note the way the patient walks into your chamber, sits, talks and behaves. We must make a habit of minute general observation; it helps a lot. Eight-month-old infant presented with persistent high fever for 6 days without apparent localisation. cursory physical examination and laboratory tests failed to arrive at the diagnosis. Astute observation revealed a small nodule over the scalp that paved the diagnosis of secondary from primary neuroblastoma. Without such an observation, the diagnosis would have never been made.

Observation in Neurological diseases

Neurological examination is mostly observation-based. One needs to touch a patient only to examine for deep tendon reflexes and sensations, all other parts of the examination are judged by observation.

Higher functions, motor system (power, tone, incoordination, nutrition and abnormal movements), most of the cranial nerves, vision, hearing, head (skull), the spine can be assessed by observation.

An old man with severe diarrhea and poor oral intake was found to be lying in a frog-like posture suggesting severe hypotonia. The paucity of movements of limbs denoted quadriparesis. However, he was conscious and well-oriented. It was clear that he had developed lower motor neuron generalised disease. Considering the background of age, diarrhea and poor oral intake, severe hypokalemia was considered and confirmed. IV fluids with appropriate composition made a quick recovery. The only test ordered was serum potassium and no other neurological tests were done. Such an observation saves time and undue expenses. One can expand observational skills by finetuning to bring out subtle abnormalities as in the case of outstretched hands showing fine tremors, pronator drift to indicate mild hemiparesis or noticing dystonia on limb movements. Observation of gait, posture, speech would also help in the diagnosis of many disorders.

Observation in hematological disorders

The probable cause of anemia can be judged by observation. Comfortable patient with severe anemia

without abdominal distension suggests chronic nutritional deficiency anemia either due to iron or vitamin B12. Further, koilonychia or knuckle hyperpigmentation would suggest iron or vitamin B12 deficiency respectively. On the other hand, a comfortable patient with severe anemia and abdominal distension indicates chronic hemolytic anemia. Such a patient may also have mild jaundice, abnormal facies and short stature. A similar presentation without abnormal facies and short stature may indicate acquired hemolytic anemia. Sick looking patient with severe anemia is likely to be either bone marrow aplasia (without abdominal distension) or infiltration (with abdominal distension) such as leukemia. Besides anemia, there may also be evidence of purpura due to thrombocytopenia or significant lymphadenopathy. Thus, comfortable or sick, abdominal distension or not and other supporting observational findings such as jaundice or short stature, abnormal facies can almost diagnose the cause of anemia. Further specific tests would be necessary to arrive at a final diagnosis.

Bleeding disorder can be another manifestation of the hematological disorder. Purpura indicates platelet dysfunction while bleeding at deeper sites usually a coagulation defect. Generalised lymphadenopathy and

hepatosplenomegaly as suggested by upper abdominal distension are other useful observational findings.

Observations in pulmonary disorders

Microanatomy of the pulmonary system consists of airways (upper and lower), lung parenchyma, pleural and interstitium. One can observe respiratory rate, depth of breathing movements, chest movements (symmetrical or asymmetrical), chest retractions (suprasternal, subcostal, intercostal or all of them). Respiratory sounds (stridor, wheeze, grunt, hissing sound and different types of cough sounds – dry or wet) beside sick or not sick. A severe cough can be evident in the observation that suggests primary airway disorder. Tachypnoea with mild cough may suggest pneumonia (grunting and intercostal retraction), pleural effusion or bronchiolitis (both of them without chest retraction, pleural effusion is localised with poor chest movements on the affected side while bronchiolitis is generalised with emphysema). Thus, microanatomical localisation is possible and common pulmonary diseases can be suspected only on observation.

Observation in liver diseases

For clinicians, the liver has four parts – hepatocyte (liver cell), biliary tract, venous system and

reticuloendothelial system (RE cells). One should observe the degree of sickness or well-being, severity of jaundice, pallor, abdominal distension (generalised with fullness of flanks or localised to upper abdomen), edema and itching marks. Acute liver disease manifests with jaundice with or without encephalopathy and bleeding. Chronic liver disease presents with oedema and upper abdominal distension. Biliary tract disease has intense jaundice, clay-coloured stools and itching, disproportionate to general well-being until disease also involves hepatocytes (hepatobiliary disease). Venous system disorders (portal hypertension) manifests with hematemesis and splenomegaly without jaundice (presinusoidal portal hypertension), chronic disease with hepatosplenomegaly, ascites and jaundice in sinusoidal portal hypertension as in cirrhosis and hepatomegaly, ascites without jaundice in post-sinusoidal portal hypertension as in hepatic vein obstruction (Budd-Chiari syndrome). RE cell involvement presents as hepatomegaly without liver cell dysfunction and subsequently may affect other organs as in storage disorders or disseminated tuberculosis or localised tumors such as hydatid cyst or hepatoblastoma.

Observation in renal diseases

Microanatomy of the kidney has three main parts – glomerulus (endothelium, epithelium and interstitium), tubules (proximal and distal) and collecting system (upper and lower). Acute renal disorders present with mild edema and sick patient (acute glomerulonephritis), generalised massive edema and comfortable patient (nephrotic syndrome) or sick with high fever but without edema (acute pyelonephritis). Short stature, pallor, edema in a chronically sick patient may represent chronic renal glomerular disease while chronically sick, a malnourished patient without edema but with rickets and deep rapid breathing (metabolic acidosis) indicate a tubular disorder. Localised fullness in the suprapubic region may suggest an enlarged bladder due to obstruction to the outflow of urine or localised fullness in the lumbar region may denote renal mass without other renal manifestations.

Observation in cardiac diseases

Microanatomy of cardiovascular system consists heart (myocardium, endocardium and pericardium), major vascular system (aorta and pulmonary blood vessels) besides probable congenital defects. Tachypnoea suggests left ventricular disease while edema of feet, engorged neck veins and upper abdominal distension indicates right ventricular disorder (CCF). Precordial

pulsations on the chest wall indicate volume overload while precordial bulge suggests cardiomegaly with pressure overload. The “Suck-rest-suck” cycle in an infant suggests exertional dyspnoea indicating cardiac failure. Severe cough and intercostal chest retractions indicate increased pulmonary blood flow as in the case of left to right shunt across VSD or PDA. Excessive sweating may be an indication of cardiac failure.

Observation in endocrinal disorders

Common endocrine disorders in clinical practice relate to thyroid, adrenal and pituitary diseases. Short and obese is an endocrinal problem (Cushing’s syndrome or hypothyroidism) while tall and obese is due to non-endocrinal disorders such as overnutrition, genetic syndromic or familial. Lethargy and facial puffiness is the hallmark of hypothyroidism. Early-onset hypothyroidism presents with developmental delay. Short proportionate stature with normal mentation is characteristic of Isolated growth hormone deficiency noticed often after the first two years of age. Diabetes is the most common disorder but cannot be suspected by mere observation. However, it may be suspected in patients presenting with generalised weakness without any observations findings.

Observation in skeletal disorders

They may present as localised or generalised bony swelling or defects. One must observe whether the patient is sick or not, type and distribution of defects and other accompanied observational findings. Sick patient with localised bony swelling may indicate local osteomyelitis while in a comfortable patient, it may signify benign or slowly progressive malignant tumor. Generalised bony defects such as chest deformities (beading of costochondral junctions and Harrison sulcus), frontoparietal bossing of skull, epiphyseal widening at wrists, bowing of legs may denote rickets or chondrodystrophy such as achondroplasia. Rickets in a healthy infant or toddler suggests vitamin D deficiency while that in a malnourished and sick patient denotes resistant rickets commonly due to chronic renal tubular disorders or other genetic disorders. Generalised bony defect with abdominal distension, chest and spinal deformities and delayed development may suggest storage disorders such as MPS – mucopolysaccharidosis. Generalised bony swelling in a sick patient may suggest leukemia, histiocytosis or sickle cell disease. Care must be taken to differentiate bony swelling from joint involvement. Though analysis of detailed history is able to pinpoint a system involved in the disease process, at times, it is not so easy. It is not uncommon that a presenting

symptom may represent any one of the systems discussed above. In such a case, the approach to observation may have to be based on basic knowledge of the genesis of symptoms. The following discussion covers the symptom-based observational approach.

Observation in case of tachypnoea

Besides the respiratory system, cardiac, neurological and metabolic disorders may share this symptom.

Moderate intercostal and/or subcostal chest retractions in not-so sick but anxious patients and often without fever would suggest cardiac tachypnoea.

Precordial pulsations and the site of apex impulse may help to define the cardiac disease. However, acute left ventricular failure (cardiac asthma) may simulate closely bronchial asthma on observation.

Tachypnoea due to neurological disease (as in the case of respiratory muscle paralysis due to Guillen-Barré syndrome) is seen as shallow breaths without chest retractions and hyperphonia or aphonia. So, it can easily be differentiated from pulmonary or cardiac diseases. Metabolic acidosis has deep and rapid breaths but the patient is not dyspnoeic which means there is no increase in work of breathing as evident by the absence of accessory muscles working. Thus,

tachypnoea without dyspnoea is the observational diagnosis of metabolic acidosis.

Observation in case of jaundice

Besides hepatobiliary disorders, jaundice is also a manifestation of hemolytic anemia that is caused by unconjugated or indirect hyperbilirubinemia (has a lemon yellow tinge and usually mild jaundice) as against conjugated or direct hyperbilirubinemia (deep yellow or greenish tinge, often moderate to severe jaundice) in hepatobiliary disorders. Pallor is the main differential feature in hemolytic jaundice and is best observed with the prominent creases on the palms. Patient with hemolytic jaundice is mostly not sick and splenomegaly is more prominent than sickness in hepatobiliary disorders with hepatomegaly in prominence and often with ascites.

Observation in case of edema

Edema may be a feature of renal, hepatic, cardiac, nutritional or allergic disorders, localised edema may be due to local venous or lymphatic obstruction. Thus, one should note whether the edema is localised or generalised. The initial appearance of edema around the eyelids is characteristic of renal disorders and most of them are not acutely sick while cardiac diseases typically present with edema on dependent parts such

as legs in a mobile patient and sacral edema in a bed-ridden patient. Such patients appear chronically sick. Edema in a chronic liver disease manifests as generalized abdominal distension due to ascites in addition to edema on the legs. Jaundice is not a feature of a compensated chronic liver disease and to a small extent may simulate chronic cardiac disease with hepatomegaly on observation. Lethargy and disinterest in routine play activities or eating and irritability when disturbed are characteristics of nutritional edema and may also present with skin and/or hair changes. Hepatomegaly is a common feature even in such a patient.

Angioedema is accompanied by signs of inflammation and itching and is often localised and hence never poses a challenge to diagnosis in case of edema.

Myxedema due to hypothyroidism also presents with puffiness of face but other features as lethargy helps to differentiate it from other causes.

Observation in case of abdominal distension

One should observe whether the patient is sick or not, localised or generalised abdominal distension, flank fullness or not, presence of significant pallor, edema, jaundice or increased peristalsis.

An acutely sick patient generally represents an acute

surgical problem as in the case of intestinal obstruction or acute appendicitis. Rarely medical conditions simulate surgical problems as seen in a severely hypokalemic or toxic patient with paralytic ileus. Chronically sick patients with abdominal distension may be due to chronic liver disease as well as malignant tumors in abdomen.

Generalised abdominal distension with the fullness of flanks denotes the presence of ascites and that in a non-sick patient suggests nephrotic syndrome. Partially treated nephrotic syndrome patient may present with the disappearance of generalised edema but ascites take time to resolve. Chronic constipation may present with abdominal distension and is usually due to a faulty diet. However, if present in a poorly nourished patient, it may be due to chronic intestinal obstruction as in case of congenital megacolon or at times due to IBD, celiac disease or intestinal tuberculosis.

Observation in case of pallor

As discussed in the section of hematological observation, the sick patient indicates mostly bone marrow disease, one with abdominal distension (hepatosplenomegaly) is infiltrative marrow disease while one without abdominal distension is due to marrow aplasia. If patient is not sick but with

abdominal distension, it is likely to be hemolytic anaemia with or without jaundice but one without abdominal distension is mostly due to deficiency anemia. Observation of other accompanying features can further narrow down the diagnostic probability.

Observation in case of short stature

As discussed in the section of endocrine diseases, short stature with poor weight and a sick patient represent chronic malnutrition either primary or secondary.

Proportionate short stature otherwise normal is due to isolated GH deficiency, genetic or constitutional problem. Those with body defects are due to rickets of various types and chondrodystrophy.

Observation in case of obesity

Short and obese is endocrinal – hypothyroidism, adrenal disorder or syndromic as Prader-Willi syndrome. Tall and obese are generally due to exogenous causes –wrong lifestyles, genetic or familial.

In summary, the power of observation guided by analysis of detailed history leads to narrowing down the clinical diagnostic probability. Other parts of physical examination finetune the diagnostic process. This would pave the way to very specific and fewer laboratory tests to confirm the final diagnosis if need be. The beauty of bedside clinical medicine is the

ability to practice medicine rationally which offers joy and a thrill to a doctor and blessings from a satisfied patient.