Amit Jain's triple assessment — a new screening method for the diabetic foot

Most patients with diabetes mellitus will develop some problem with their feet. Early recognition of foot problems can be limb saving. Diabetic foot screening is an important strategy in identifying high risk patients. There are various screening methods in diabetic foot across the world each having their own merits and demerits. Amit Jain's triple assessment is a new simple screening method for diabetic foot from Indian subcontinent which aims to detect the triad of diabetic foot namely infection, ischemia and neuropathy.

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Diabetic foot is one of the most common complications in people with diabetes mellitus and can lead to lower limb amputation (Morshed, 2011). Amputation occurs 10–30 times more commonly in people with diabetes when compared to general population (Woodbury, 2015). It is known that 15% of patients with diabetes are likely to develop a foot ulcer in their lifetime (Yazdanpanah, 2015). Around 56% of diabetic foot ulcers get infected and many may end up in some form of lower extremity amputation (Gibbons, 1984; Smith, 1987; Wu, 2015).

The diabetic foot on the whole is a classical triad of neuropathy, infection and ischemia (Pendsey, 2010; Jain, 2017). Early identification of these can actually alter the disease process and prevent amputation. This is best achieved by screening to determine whether a disease or condition is present. Screening is done in a number of different ways, e.g. mass screening, multiphasic screening, high-risk screening, multipurpose screening and opportunistic screening (Suryakantha, 2014; Park, 2015).

High-risk screening is screening of only a group of population who are at a high risk of the disease and not of the entire population. This is also called Selective screening or Targeted screening (Suryakantha, 2014; Park, 2015).

Screening of diabetic foot has to be considered a preventive care strategy as it can prevent amputation, which leads to debilitation with a huge socioeconomic consequence.

Screening is quite different from a diagnostic test (Park, 2015). It is believed that screening should be inexpensive and should require little physician or health care professional time (Park, 2015).

The author believes that diabetic foot evaluation can be either through screening or through examination (Jain, 2017). There is a well-known difference in both these types of evaluation. Screening of foot is a quick evaluation identifying those factors that lead to risk of amputation. An examination of foot refers to a detailed evaluation that can be a laborious and time consuming method (Jain, 2017). Diabetic foot screening can be undertaken by any healthcare professional or ancillary staff (Muzaini, 2017) whereas examination is often done by a specialist.

Screening of diabetic foot is essential and the author feels that it fulfills most criteria laid down for screening (Park, 2015):

- It is an important health problem
- The pathway/natural history is adequately understood
- There is an asymptomatic stage. Example – neuropathy and peripheral vascular disease may remain asymptomatic
- There are tests that can detect the disease prior to onset of signs and symptoms
- Effective treatment can be instituted once disease is detected by screening
- There are also agreed policy and protocol on whom to treat
- There is good evidence to show that early detection and treatment reduced morbidity and mortality
- Expected benefits of screening of diabetic foot by early detection exceed the risk and costs.

There are many screening tools like In low's screening tool, 60 seconds screening tool, etc (Jain, 2017) which are commonly used in different regions. Amit Jain's triple assessment of foot is simple, safe and a rapid new screening

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method that was proposed recently from Indian subcontinent (Jain, 2017). This screening is easy, acceptable, repeatable and inexpensive (Park, 2015; Jain, 2017), that can be performed by any health care professional in any part of the world without difficulty. Amit Jain's triple assessment for diabetic foot addresses all the triad namely neuropathy, infection and ischemia (Pendsey, 2010; Jain, 2017).

The author classified diabetic foot infections in general into primary where infection occurs directly into foot and secondary where the infection occurs in pre-existing pathology like an ulcer (Jain, 2017). Primary infections are usually acute. Most of the Amit Jain's type 1 diabetic foot complications like abscess, cellulitis, necrotizing fasciitis etc are primary diabetic foot infection (Jain, 2017).

Amit Jain's triple assessment of foot is a concept that is derived from routine clinical examination done in surgery (Das, 2008) and triple assessment done in breast lump (Jan, 2010). This triple assessment of foot has three components namely: Look, Feel and Test which addresses all the triad of diabetic foot very effectively namely infection, ischemia and neuropathy.

In the **Look** component, an ulcer/infection is identified. The parts of the foot needs to be seen are dorsum of foot *[Figure 1]*, plantar surface *[Figure 2]* and interdigital areas *[Figure 3]*.

In the **Feel** component, the dorsalis pedis/posterior tibial artery is palpated *[Figure 4]* to assess the blood flow to foot. An absent foot pulse should alert one for further assessment and investigation.

In the **Test** component, neuropathy is detected by any of the following methods in isolation or preferably in combination and they include monofilament testing *[Figure 5]*, tuning fork, vibratip, biothesiometer, pin prick test, etc (Jayaprakash, 2011; Phulpoto, 2012; Arshad, 2016).

The tuning fork, vibratip and biothesiometer are used to assess vibration sensation whereas the pinprick and monofilament is used to test touch sensation (Giovinco, 2015). One can use the above in combination to test both sensation and vibration and should check at least three to four sites. The common sites are plantar aspect of great toes, base of 1st, 3rd metatarsal, 5th metatarsal (Phulpoto, 2012; Giovinco, 2015; Arshad, 2016)

Advantages of the new screening tool

The advantages of Amit Jain's triple assessment are:

- It is a simple screening tool
- It is very practical

Figure 1. (left) The dorsum of the foot.
Figure 2. (right) The plantar aspect of foot.

Figure 3. (left) The interdigital area.
Figure 4. (right) Palpation of dorsalis pedis artery.

Figure 5. (above right). The palpation of the posterior tibial artery.

- Easy to remember and perform
- It can be a good teaching tool
- Fulfills most criteria laid down for screening (Park, 2015)
- It addresses all the three components of diabetic foot effectively
- Any health care professional can use it
- It is serves as a good record of diabetic foot evaluation.

Sometimes Amit Jain's single assessment and double assessment for foot in diabetes is performed in certain situations (Jain, 2017). DFJME

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