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Research Article

AMIT JAIN'S RULE OF '3'' FOR DIABETIC FOOT

DR AMIT KUMAR C JAIN*

*Consultant And Head, Amit Jain's Institute Of Diabetic Foot And Wound Care, Brindhavvan Areion Hospital, Bangalore, India

*Associate Professor, Department Of Surgery, Rajarajeswari Medical College, Bangalore, India.

Abstract: There are various rules that exist in field of medicine and surgery like rule of 3, rule of 9, rule of 10, etc. Each of these rule's have some purpose ranging from creating awareness to guiding treatment. In field of diabetic foot, there is 'rule of 15' applicable to ulcers. The author proposes a new "Amit Jain's rule of 3" for Diabetic foot that consist of all the "3's" seen in foot. This is probably one of the largest open rules in field of medicine/surgery till date.

Keywords: Diabetes, Rule, Amit Jain, Foot, India, Statement

INTRODUCTION

Diabetes mellitus is rising around the world and is a well known serious condition affecting most of the organs in the human body. Diabetic foot is one of the most common and significant devastating complication of diabetes [1]. It has significant morbidity, mortality and cost [2] with patients being at risk of amputation [2].

This article aims at discussing various rules in medicine/surgery, existing rule in diabetic foot and the New Amit Jain's rule of '3' for diabetic foot.

CURRENT RULES IN MEDICAL FIELD

Various rules have been proposed in different branches of medicine and surgery. Some well known rules are rule of 10's in pheochromocytoma [3], Rule of 6 in AV fistula [4], rule of 9 in burn's [5], Goodsall's rule for anal fistula [5], rule of 10 for cleft lip [5], rule of 10% for sentinel lymph node in melanoma [6], etc.

In field of diabetic foot, there is rule of 15% [7, 8]. According to this rule, 15% of all diabetic foot patients will develop foot ulcer in their lifetime, 15% of ulcers will develop osteomyelitis and 15% of ulcers will result in amputation [7, 8].

Each of these rules was proposed with some aim. Some rules suggest epidemiological prevalence, some suggest anatomical location, and some guide assessment whereas some guides treatment.

AMIT JAIN'S RULE OF '3' FOR DIABETIC FOOT

The author proposes a new rule in diabetic foot called AMIT JAIN'S RULE OF '3'. The author ensemble all the 3's seen in foot over decades. This rule could be general (anatomical) and specific (diabetic foot).

In general rule (anatomical rule), all the "3's" that occur in foot of all people, be it diabetic or non diabetic are included. These "3's" are basically related to anatomy of foot [Table 1] and the common "3's" are as follows [9, 10, 11, 12].

A) There are 3 cuneiform bones (Medial, Intermediate, Lateral)
B) There are 3 Phalanx (Proximal, Middle, Distal)
C) There are 3 arches [10] in the foot (Medial longitudinal, Lateral longitudinal, Transverse arch)
D) Foot is divided into 3 parts (Forefoot, Midfoot, Hindfoot)
E) There are 3 plantar interossei
F) There are 3 muscles in 3rd layer of foot
G) There are 3 major forms [11] of foot (Egyptian, Roman, Greek)

H) There are 3 main Leg arteries [12] supplying the foot (Anterior tibial, Posterior tibial, Peroneal artery)

'3' cuneiform bones
'3' phalanx in lesser toes
'3' arches in the foot
'3' parts of foot
'3' plantar interossei
'3' muscles in 3rd layer of foot
'3' major form of foot
'3' main leg arteries supply foot

Table 1 showing the common general rule of "3" [Amit Jain's rule of "3's"]

There are also uncommon/rare forms of "3's" that can be seen in foot anatomy.

In the specific rule, all the "3's" that can be seen commonly in diabetic foot [Table 2] over years are included. They are as follows [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26,

27, 28].

A) Diabetic foot is characterized by 'triad' namely neuropathy, ischemia and infection [13]. It's also known as triopathy.

B) The neuropathy is of 3 types namely sensory, motor and autonomic [14].

C) Amit Jain's Triple assessment for foot is the new evaluation tool for foot in diabetes [15]. It can be basic evaluation (Screening) or detailed evaluation (Advance LFT). Another detailed evaluation that already existed is 3 minute foot exam [16].

D) Diabetic foot is classified into 3 main types of complication namely Amit Jain's type 1, type 2, and type 3 diabetic foot complications [17].

E) Infections like abscess can occur at any of the following 3 sites namely, dorsum, plantar and interdigital areas [15].

F) Diabetic foot can be affected by any of the 3 gangrene's namely wet gangrene, dry gangrene and gas gangrene [18, 19].

G) There are 3 common bony problems in diabetic foot. They are osteomyelitis, toe deformities and charcot foot [17, 18].

H) There are 3 common saggital planes lesser toe deformities [20]. They are hammer toe, claw toe and mallet toe.

I) There are 3 new classes of diabetic foot ulcers. They are Amit Jain's class 1, class 2 and class 3 diabetic foot ulcers [21]. The another well known classification for diabetic foot ulcers is neuropathic, neuroischemic and ischemic [22].

J) There are 3 components in Amit Jain's coding system for diabetic foot ulcers [23]. They are size, anatomical part and class of ulcer [S.A.C coding].

K) Amit Jain's debridement classification has 3 components [24]. They are grade, extent and repetition [G.E.R].

L) The 3 commonest amputations done in diabetic foot are toe amputation, transmetatarsal amputation and below knee amputation [25, 26].

M) Diabetic foot wounds can be offloaded with any one of the Amit Jain's 3 types of offloading [27]. They are simple offloading, complex offloading and complicated offloading [Amit Jain's classification for offloading].

N) The diabetic foot at risk should be followed at least once in 3 months [28]. There are various recommendations for diabetic foot follow-up ranging from 1 year to 3 months follow-up based on risk category they belong [28].

O) Diabetic foot is governed by 3 Amit Jain's law [23, 27, 29].

'3' main causes (Triad)
'3' neuropathy (Sensory, Motor, Autonomic)
'3' components in Amit Jain's screening (Triple assessment)
'3' main types of diabetic foot complications (Amit Jain's Type 1, Type 2, Type 3 complications)
'3' sites for abscess (Dorsum, Plantar, Interdigital)
'3' types of gangrene (Wet gangrene, Dry gangrene, Gas gangrene)
'3' common bone problems (Osteomyelitis, Toe deformities, Charcot foot)
'3' common saggital plane lesser toe deformities (Hammer toe, Claw toe, Mallet toe)
'3' new classes of ulcers (New Amit Jain's Class 1 , Class 2, Class 3 diabetic foot ulcers)
'3' components in Amit Jain's ulcer coding (Size, Anatomical area, Class)
'3' components in Amit Jain's debridement classification (Grading, Extent, Repetition)
'3' commonest amputation done (Toe amputation, Transmetatarsal, Below knee amputation)
'3' types of offloading (Amit Jain's type 1, type 2, type 3)
'3' monthly follow up (at risk foot)
'3' laws in diabetic foot (Amit Jain's law's)

Table 2 showing the Specific rule of '3' in diabetic foot (Amit Jain's rule of "3's").This is an open rule.

The rule of '3' is an open rule which means that any other "3's" in diabetic foot that has been missed by the author specific for diabetic foot and those that will develop in future can be included into this rule of "3's" without creating any new rule (Modified or extended) of "3's" for diabetic foot.

AMIT JAIN'S STATEMENT FOR DIABETIC FOOT

The above specific rule can be summarized into following new statement that can completely describe diabetic foot in a nutshell. The new Amit Jain's statement for diabetic foot is as follows.

"Diabetic foot is caused by a triad consisting of neuropathy, ischemia and infection with neuropathy being of 3 types. The triple assessment for foot should be the minimum evaluation tool for diabetic foot. The diabetic foot complications can be categorized into any of the 3 types. Diabetic foot can be affected by many pathological lesions ranging from abscess that can occur at any of the 3 sites, any of the 3 gangrenes, any 3 bony problems with the lesser toes being affected with any 3 deformities or by ulcers that can be placed into any one of the 3 classes which can be coded with 3 components. One of the commonest surgical procedures on diabetic foot is debridement that can be classified in 3 components. Patients may end up in one of the 3 common amputations. Diabetic foot wounds can be offloaded with any one of the 3 types. The diabetic foot at risk should be followed at least once in 3 months. Diabetic foot is governed by 3 laws"

CONCLUSION

Diabetic foot is a known common complication in diabetes. Various new concepts are evolving in diabetic foot. Amit Jain's rule of '3' is a new contribution in diabetic foot that encompasses all the common "3's" that can be seen in diabetic foot. This is one of the largest rules in medical field proposed from India. The entire diabetic foot can be summarized in the

New Amit Jain's statement for diabetic foot that makes the understanding of this disease much simpler.

REFERENCES

[1] Alexiadou K, Doupis J. Management of diabetic foot ulcer. Diabetes Ther 2012;3:4.

[2] Toscano CM, Sugita TH, Rosa MQ et al. Annual direct medical costs of diabetic foot disease in Brazil: A cost of illness study. Int J Environ Res Public Health 2018;15: 89.

[3] Baez JC, Jagannathan JP, Krajewski K et al. Pheochromocytoma and paraganglioma: Imaging characteristics: Cancer imaging 2012;12(1):153-162.

[4] Baneerjee S. Fistula maturation and patency for successful dialysis. Dialysis and transplantation 2009:1-2.

[5] Bhat S. In: SRB's manual of surgery. 3rd edition. Jaypee, India, 2009.

[6] Kroon HM, Lowe L, Wong S et al. What is a sentinel node? Re-evaluating 10% rule for sentinel node biopsy in melanoma. J Surg Onco 2007;95:625-628.

[7] Ahmed AA, Elsharief E, Alsharief A. The diabetic foot in the arab world. J Diab Foot Comp 2011;3(3): 55-61.

[8] Blume PA, Zgonis T. Medical and surgical management of diabetic foot and ankle. In: Clinics in Podiatric Medicine and Surgery.Vol 31. Elsevier, Philadelphia, 2014.

[9] Garg K, Mittal PS, Chandragupta M. Lower limb, abdomen and pelvis. In: BD Churasia's Human anatomy. 6th edition. Volume 2, CBS publishers, New Delhi, 2013.

[10] Kapandji IA. The physiology of the joints:Lower limb, Vol 2, Churchill Livingstone, 1988.

[11] Vounotrypidis P, Noutsou P. The greek foot: is it a myth or reality?An epidemiological study in Greece and connections to past and modern global history. Rheumatology 2015;54(1):i182-i183.

[12] Sporeal WE, Deimling P, Aitken R. Direct arterial pressure monitoring from the dorsalis pedis artery. Canad Anaesth Soc J 1975;22(1):91-99.

[13] Pendsey SP. Understanding diabetic foot. Int J Diabetes Dev Ctries 2010;30(2):75-79.

[14] Guttormsen K, Chadwic P. Diabetic neuropathy: Beyond the basics. J Diabetes Nursing 2017;21(1):17-22

[15] Jain AKC. Amit Jain's triple assessment for foot in diabetes – the simplest and the fastest new screening tool in the world. IJMSCI 2017;4(6):3015-3019.

[16] Miller JD, Carter E, Shih J et al. The 3 minute diabetic foot exam. J Fam Pract 2014;63(11):646-656.

[17] Jain AKC. A new classification of diabetic foot complications: a simple and effective teaching tool. J Diab Foot Comp. 2012;4(1):1-5.

[18] Dhubaib H. Understanding diabetic foot complications: in praise of Amit Jain's classification. DFMJE 2015;1(1):10-11.

[19] Kono S, Nakagawachi R, Arata J, Lipsky BA. Massive gas forming gangrene in a diabetic foot infection. CLin Res Foot Ankle 2014;2:4.

[20] Malhotra K, Dauda K, Singh D. The pathology and management of lesser toe deformities. EFFORT Open Rev 2016;1:409-419.

[21] Jain AKC. A simple new classification for diabetic foot ulcers. Med Science 2015;4(2):2109-20.

[22] Ndie A, Ebah L, Mbako A. Neuropathic diabetic foot ulcers- evidence to practice. Int J Gen Med 2012;5:129-134.

[23] Jain AKC. Amit Jain's coding system for diabetic foot ulcer. IJMSCI 2017;4(7):3126-3128.

[24] Jain AKC. Amit Jain's modified grading system for debridement in diabetic lower limb. IJMSCI 2016;3(9):2193-2195.

[25] Kalaivani V. Evaluation of diabetic foot complication according to Amit Jain's classification. JCDR.2014;8(12):7-9

[26] Singh M, Singh R. Evaluation and management of diabetic foot complications using Amit Jain's classification – An Exploration of use. Diabetic Foot Journal Middle East 2016;2(1):16-19.

[27] Jain AKC. Amit Jain's classification for offloading the diabetic foot wounds. IJMSCI 2017;4(5):2922-2925.

[28] Bus SA, Netten JJ, Lavery LA et al. IWGDF guidance on the prevention of foot ulcers in at-risk patients with diabetes. Diabetes Metab Res Rev 2016;32(1):16–24.

[29] Jain AKC. Amit Jain's system of practice for diabetic foot: the new religion in diabetic foot field. Int Surg j 2018;5(2):368-372.