Glucodynia

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Abstract

Pain in patients with diabetes can be unpleasant, but at times protective as well. We propose the term 'glucodynia' i.e., an unpleasant sensory and emotional experience, associated with or without any organ-system dysfunction, in people living with diabetes. Glucodynia may be due to microvascular, musculoskeletal, metabolic, mood-related, miasmatic, mitogenic, visceral myogenic, malnutrition-related or medicine-related (iatrogenic) causes. In this manuscript we explain the different mechanisms of pain in patients living with diabetes. Furthermore, the therapeutic modalities that can be used to reduce pain sensation are described.

Keywords: Diabetic neuropathy, glucodynia, pain, paresthesia, person centered

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Introduction

Pain is a subjective phenomenon, described as "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage (International Association for the Study of Pain).[1] Pain can be acute, subacute or chronic, can be generalized or localized, and can be due to dysfunction of various systems: neurologic, psychologic, musculoskeletal or visceral organs. Pain signals are carried through thick myelinated A-delta and thin unmyelinated C fibres to the spinothalamic tract, and finally to the thalamus and insulin cortex.[2]

Mechanisms of pain include activation of nociceptive (stimulation of sensory nerve fibres by stimuli of harmful intensity, e.g., extreme temperature, mechanical injury, chemical insult), neuropathic (dysfunction of peripheral, central or both parts of nervous system), nociplastic (altered nociception without evidence of real or potential tissue damage), and psychogenic (mental, emotional or behavioural etiology) pathways.[2]

People living with diabetes often seek medical assistance for pain. Pain is multifactorial and multifaceted. It may occur due to dysfunction of any part of the pain pathways, and may localize to any part of the body. These characteristics are used to "label" pain and plan its management. While classifying pain in a systematic manner does help in clinical evaluation, the person living with pain is concerned about holistic addressal of his or her symptoms.[3]

Glucodynia: Pain and Diabetes

We propose the term 'glucodynia' to promote a person-centred, bio-psychosocially based approach to pain in persons with diabetes. We define glucodynia as pain, i.e., an unpleasant sensory and emotional experience, associated with or without any organ-system dysfunction, in persons living with diabetes. Glucodynia may be due to microvascular, musculoskeletal, metabolic, mood-related, miasmatic, mitogenic, visceral myogenic, malnutrition-related or medicine-related (iatrogenic) causes. (Table 1)

Person Centered Approach for a patient with Glucodynia

In many cases, multiple mechanisms of pain may operate at multiple sites. The MOAN syndrome reminds us to be mindful of muscular, osteo(bone), arthro (joint) and nerve related cause of pain in every individual.[4] The concept of glucodynia builds, and expands upon this framework by including the need for evaluating the causative factors, as well as emotional aspects of pain, along with assessing the site of involvement. The success of management of glucodynia depends upon the completeness of evaluation of the causative factors, clinical features, comorbid conditions, and complications of pain. The patient's

Table-1: Mechanisms of Glucodynia: The Nine Ms.

Analyze current coping style
• Musculoskeletal, e.g., frozen shoulder, osteoporotic fracture
• Microvascular, e.g., diabetic painful neuropathy
• Metabolic, e.g., gout
• Mood-related, e.g., diabetes distress
• Miasma (infection)-related, e.g., abscess
• Mitogenic, e.g., malignancy-related pain
• Visceral myogenic, e.g., gastrointestinal or urinary tract spasm, dysmenorrhea
• Malnutrition related, e.g., osteomalacia, nutritional neuropathy
• Medicine related (iatrogenic), e.g., insulin neuritis, statin induced myopathy

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Table-2: Management of glucodynia.

Basic hygiene
● Nutritional optimization
▪ Macronutrient
▪ Micronutrient
● Lifestyle optimization
▪ Physical conditioning
▪ Stress management/Coping skills training
● Metabolic optimization
▪ Good glucose control
▪ Control of metabolic comorbidities
● Etiology-specific management
● Symptom-specific management
● Supportive care
▪ Physiotherapy
▪ Mechanical aids

complaints and concerns, along with challenges and concomitant medication, must be kept in mind while planning a management strategy.

Viewing pain through a purely mechanistic approach, or limiting one's evaluation to a single organ system may offer a tubular, i.e., incomplete assessment of the person's health status. Person centred pain management is a well-developed school of medicine which promotes holistic management of pain. Using the word glucodynia focuses attention on the person, and on his or her concerns: diabetes and pain, in a person centred manner.

Pragmatic Pearls

Glucodynia must be enquired for, as part of routine clinical evaluation of diabetes, at each clinical encounter. Relevant physical examination and investigations must be ordered as per standard of care, and appropriate therapy instituted. Table 2 lists the type of interventions that may be offered to persons with varying causes of glucodynia. Lifestyle, nutritional and metabolic optimization, including environmental modulation, adequate nutrient intake, and good glucose control will always be the cornerstone of glucodynia care.[5] Appropriate use of symptom relieving drugs, and disease modifying drugs, will also be necessary. Diabetes care professionals should be aware of the wide variety of anti-inflammatory, neurotropic and condition specific drugs that are available for use in glucodynia. They should also be aware of their indications, contraindications, caveats and concerns that must be kept in mind while using them.[6]

Glucodynia – a protective phenomenon

Though pain as described before is perceived as uncomfortable and is not welcome, loss of pain sensation can also at times result in detrimental consequences. Dr Paul Brand, who worked on leprosy related neuropathic limbs once said that "pain is the best gift to mankind", as loss of pain in patients could lead to asymptomatic deep foot ulcers that often end up in amputation.[7] Therefore, in patients with glucodynia when patient becomes symptom free without treatment, it means that diabetic neuropathy is progressing, and mechanisms must be put in place for daily visual inspection to detect asymptomatic ulcers.

Summary

The term "glucodynia" refers to pain related symptoms in patients with diabetes mellitus. The different mechanisms of pain in patients with diabetes can be described in a simple, easy to remember framework called the 9 M's. Furthermore, different treatment modalities that can be used to manage glucodynia must be used within a holistic framework. Pain is not always a bad symptom in people living with diabetes: complete loss of pain is also not good and can lead to several complications including amputation.

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