Knowledge of physiotherapist about physical therapy treatment of diabetes complications

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Abstract:
Definition of the term diabetes mellitus covers a group of metabolic diseases characterized by elevated blood glucose levels. According to the latest 2016 data from the WHO, 422 million adults are living with diabetes mellitus. Diabetes prevalence is increasing rapidly, because physical inactivity and overweight are risk factors who are increasing too. Complications from diabetes mellitus can be treated with physical modalities. The aim of our research was to assess the knowledge of physiotherapists for treatment of complications from diabetes mellitus with physical medicine.

Material and method: We have designed special questionnaire with 30 questions to assess, knowledge for treatment of diabetic foot, diabetic ulcer, amputation, and diabetic neuropathy. The data was collected electronically by email. The knowledge was assessed with score: 0-25% poor, 26-50% fair, 51-75% good, 76-100 % excellent.

Results: Physiotherapist have had an average score of 40% of the total knowledge, the lowest was about effect of light therapy on diabetic ulcers and treatment of diabetic neuropathy.

Discussion: Treatment of diabetes with insulin, is standard in medicine. Physical medicine has important role in prevention of diabetes, with promotion of physical activity. Complications of diabetes decrease quality of life, with many complications affecting circulation, nerves and bones. Researchers are looking for new ways of non-pharmacological treatment of complications.

Conclusion: Our medical staff have had, fair knowledge about effect of physical modalities in treatment of complications from diabetes mellitus. Future lectures must contain more attention about this health problem.

Key Words: diabetes mellitus, knowledge, physical medicine modalities

Introduction:
The number of people with diabetes mellitus has quadrupled in the past three decades. Globally, about 1 in 11 adults have diabetes mellitus (90% have type 2 diabetes mellitus- T2DM). Among patients with T2DM, cardiovascular complications are the leading cause of morbidity and mortality, and kidney complications are highly prevalent in patients. Management strategies including lifestyle modifications, social support and ensuring medication adherence are key to reducing the incidence of diabetes mellitus complications. By making bad lifestyles changes, people can increase risk of developing type 2 diabetes. These include an unbalanced diet, lack of activity, lack of sleep, stress, smoking and alcohol. Type 2 diabetes mellitus is emerging as a new clinical problem within pediatric practice. Recent reports indicate an increasing prevalence of type 2 diabetes mellitus in children and adolescents around the world in all ethnicities.3 Complications from diabetes mellitus are broadly classified as microvascular, including neuropathy, nephropathy, and retinopathy, or macrovascular, including cardiovascular and peripheral vascular disease. The risk for developing complications is influenced by many factors including duration of diabetes and genetic factors. Current treatments have resulted in only a partial reduction in this risk, and the management of these conditions.4 Patients with diabetic retinopathy are not treated in area of physical medicine. But other complications like circulatory changes, in early stage, or patients after amputation are rehabilitated on physical medicine department. The diabetic Charcot foot syndrome is a serious and potentially limb-threatening lower-extremity complication of diabetes. Charcot foot, can be treated with physical modalities, and orthoses.5 The typical change is on the skin of the foot of the patient with diabetic ulcer. This condition can be prevented and treated with special shoes and
Diabetic neuropathy can be prevented and treated with physical modalities like magnet field, light therapy, hydro galvanic current and TENS. Effect of some physical therapy modalities, and its presentation in other medical specialties is not enough because there are not standardized protocols for treatment. We have included them as a lecture but only the basic part, and as indications for some diabetic complications but not like a specific treatment for it. Adequate knowledge of diabetes is a key component of diabetic care. Many studies have shown that increased patient knowledge regarding disease and its complications have significant benefits with regard to patient compliance to treatment and to decreasing complications associated with the disease. The aim of our research was to assess the knowledge of physiotherapist for treatment of complication, from diabetes mellitus with physical medicine.

**Material and method:**
We have designed special questionnaire with 30 questions to assess, knowledge for treatment of diabetic food, diabetic ulcer, amputation, and diabetic neuropathy. The data was collected electronically on social web site for physiotherapists with high education. The knowledge was assessed with score: 0-25% poor, 26-50% fair, 51-75% good, 76-100 % excellent. We have interweaved 130 physiotherapist, with questionnaire, consisting of few parts. 1. Personal data, 2. assessment of knowledge for diabetes mellitus (DM) as a metabolic disease, 3. Knowledge for treatment 4. Knowledge of complications of DM, 5. treatment with light therapy, 6. knowledge for prevention activities 7. Diabetic ulcer and its treatment, 8. Diabetic pain and neuropathy, diagnosis and treatment 9. Etiology of amputation in DM patients, 10. pathology of renal complication from DM. The answers were classified as right, not right and unknown.

**Questionnaire for assessment of knowledge of physiotherapist about the place of PM&R in treatment of complications of DM**

<table>
<thead>
<tr>
<th>Number</th>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
<th>Age in years</th>
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</thead>
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1. Diabetes Mellitus is: *a) metabolic illness b) circulatory illness c) neurological disease*
2. Diabetes Mellitus (DM) is with increased prevalence in:
   a) high blood pressure *b) obesity *c) weight by work *d) low physical activity
3. DM is developed by lack of: *a) insulin b) amylase c) vitamin D*
4. DM can be treated with: *a) supplements of B vitamins b) insulin c) decrease of fats intake*
5. DM as a chronic disease can lead to damage of: *a) liver b) pancreas *c) skin *d) kidney*e) retina *j) nerves*
6. Are the following conditions complications of DM?

<table>
<thead>
<tr>
<th>Hypertension</th>
<th>Yes</th>
<th>No</th>
<th>Un know</th>
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<tbody>
<tr>
<td><em>coronary heart disease</em></td>
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<td><em>Diabetic ulcer</em></td>
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<td><em>Nephropathy</em></td>
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<td><em>Poly neuropathy</em></td>
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<td><em>Sexual dysfunction</em></td>
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<td><em>Amputation</em></td>
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<td><em>Retinopathy</em></td>
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<td><em>Osteoporosis</em></td>
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7. Name some activities in PM&R with which people can prevent DM:
   1. 2. 3. 4. Un Know
8. Which is a rare skin defect from diabetic etiology: a) purulent ulcer b) pressure wound c) diabetic ulcer
9. Possibilities for treatment of diabetic wound with physical therapy modalities? a) electro therapy b) light therapy c) sonotherapy d) un know
10. Which are the complications of vessels lesions:
      a) skin damage b) gangrene c) increase pain sensation d) un know
11. Treatment of diabetic pain with medicaments?
      a) anti-rheumatics b) central analgesics c) opiates d) un know
12. How we treat pain in patients with DM, in PM&R:
      a) hydro therapy b) TENS c) exercises
13. Which orthoses are prescribed in patients with DM? a) foot apparatus b) shoes c) knee orthoses d) unknown
14. What is the most common complication due to nerve damage in patients with DM:
      a) impotent b) loss of smell c) loss of skin sensibility d) hypo-analgesic e) loss of taste
      g) loss of hearing j) un know
15. Which frequent etiology of lower extremity amputation?
      a) tumor b) injury c) decrease of circulation d) unknown
16. Which effect has physical activity on blood glucose level?
      a) decrease b) increase c) no change d) un know
17. Which are complications of DM on kidneys?
      a) acute kidney insufficiency b) stones c) chronic kidney insufficiency d) no damage
      e) un know
18. How can FM&R help in pain management, in patients with DM?
      a) electro therapy b) hydro therapy c) bath therapy with hot water d) light therapy
      e) un know
19. Which tests must be done before application of physical therapy with skin contact?
      a) to measure circumference of limbs b) to test pain feeling and sensibility c) to make manual muscles test
20. Do you know any protocol for PM&R in patient with DM in our environment? yes no
21. In your opinion, with which activities from PM&R can we help people with DM and complications from it?
      a) exercises b) light therapy c) hydro therapy d) orthoses e) electro therapy g) un know
22. Which is cardinal factor after amputation of limbs with DM etiology to apply prostheses?
      a) general condition of patients b) visual condition c) condition of no amputated leg
      d) co morbidity of cancer e) mental condition of patient j) gastro intestinal disease g) kidney condition,
23. Diabetic wounds are treated surgical, but in prevention and treatment after surgical treatment we can use which light therapy? a) infra-red b) ultraviolet c) polarized light d) low level laser e) led diode j) unknown
24. Do you know bio stimulate effect of light therapy and its physiological effect? yes no
25. What is the most common complication from DM on foot bones?
      *Answer: Charcot foot
26. Which is the role of pre-surgery rehabilitation in patients going for leg amputation?
      a) to teach the patient, care for amputated limb b) to teach how to walk with crutches
      c) to teach how to manage pain d) to know conditioned upper extremities e) unknown
27. Which are consequences from chronic kidney failure on locomotor system?
      1) cartilage damage b) soft tissue calcification c) osteoporosis d) pathological fracture
      e) pain j) ligament and tendons rupture g) swelling in joints h) osteomyelitis f) unknown
28. Is physical therapy used for patients with renal bone dystrophy? yes no
29. If your answer is yes, which medical hospital, do that in our country?
30. Which is the biggest problem, which decrease quality of life in patients with renal bone dystrophy on dialysis?
   *a) decreased mobility b) no medicaments *c) pain d) special diet e) not enough capacity for dialysis in our health system.
   The correct answer is marked with *

**Results:**

We have interviewed 130 physiotherapists with university degree of education, 30% male and 70% female. All were our students before finished their study in average of 27 years.

Results from questionnaire are showed in table 1 and figure 1.

**Table 1: Results from questionnaire**

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Table 2: Questions with low answers 0-25%

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Figure 1. Knowledge by question

The lowest knowledge score was in the following questions with score from 0-25%, showed in table 2.
According to table 2, the physiotherapists have no knowledge in treatment for neuropathic pain with PM& Reha, as well as the diabetic complications on the nervous system. They also need to increase knowledge in bio-stimulation effect of light therapy, as well as the bone complications in patients with chronic kidney failure that has appeared as a complication of DM.

**Discussion:**

Diabetes can be found in all regions of the world especially in the developed countries. Many funds are being used from the health funding in order to provide substitute therapy with insulin and medications for the complications. There are many strategies to reduce the number of patients with diabetes, with promotion of physical activities and good nutrition. Obesity is a risk factor No. 1 for diabetes type 2, but what is worrying is the increase in diabetes in adolescents and teenagers due to inactivity and fast food. This can be prevented with national programs for promoting healthy food and physical activity in young age. Physical medicine like a medical branch in modern medical health system have its own place in prevention and treatment of complication of diabetes mellitus like one non-pharmacological treatment. Physical medicine doctor is leader in managing of rehabilitation after complication of DM. Physical medicine doctor can only assess the body condition of patient and prescribe amount of physical activity according to condition of patient. Other specialists have their own activity, but they are not educated for prescription of orthosis, prosthesis, and non-pharmacological treatment. Treatment of patients with DM, is complex. There are some guides for early detection of patients with DM, early testing for complications, but the treatment with physical therapy modalities is not included in those guides. We educators in physical medicine, must have special place to promote our activities in scientific way. It is exactly true that physical activity, not only prevent, but also decrease level of glucose in blood. Light therapy like LLLT and polarized light, have positive effects on skin healing, and improve blood perfusion. In our health system, it must be paid by patient themselves because it is treated like alternative medicine. Magnet field treatment, is treated like not proven type of treatment, and researches are not significant, because there are not enough patients and following parameters for evaluation. Electro gymnastic, and pain treatment with electric storm, like TENS, are accepted as safe and effective treatment, for neuropathy. Patients with diabetes, usually have osteoporosis, non-pharmacological treatment with physical therapy modalities, is a way of treatment in addition for the regular treatment of it. There are many positive effects of bath therapy like aromatherapy and exercise in water for improvement of circulation. In our health system, we have no protocols about physical therapy for patients with DM and also no questionnaire surveys are made for assessment of quality of life. Because of this reason we want to assess the physiotherapists’ knowledge, about this actual health problem. In the future it should be good to assess patients’ education about DM and other medical specialties. Those data shall show us in which direction to develop and promote physical medicine in presented situation.

**Conclusion:**

We are researchers and educators in physical medicine and medical care. To make good education is important to follow what is with high incidence in population and to find our possibility to help people. Our research showed us that physiotherapist in our environment have fair knowledge about possibilities of treating patients with DM with physical medicine. In the future plane of lectures, or in special courses, we can involve this problematic in education as important.

**References:**


