Original Article

Clinical audit on assessment of non-glycemic parameters in diabetic patients by physicians

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Abstract

Background: Diabetes mellitus (DM) is a major health problem in family practice causing multiple micro and macrovascular complications; the prevention of which should be the main aim of treating physicians. Lack of proper assessment can hasten the complications and a meticulous screening system is a prerequisite in every diabetic patient's evaluation. **Objective:** The aim of this study was to assess the pattern of screening for non-glycemic parameters in type 2 DM patients by physicians in an outpatient setting. **Methods:** A cross-sectional study was conducted in a teaching hospital during December 2019. A total of 254 patients with type 2 DM without any complications were randomly selected for screening as per the criteria developed by RSSDI [Research Society for the Study of Diabetes in India]. **Results:** Complete history and physical examination were done by physicians in all the participants. Measurement of blood pressure at every visit was done in about 95% of patients and 90% of them were counseled for cessation of smoking. But only about 60% or less of patients were screened for microalbuminuria, diabetic retinopathy, and peripheral neuropathy. Advice on comprehensive foot care was also not a regular practice among physicians. **Conclusion:** This clinical audit showed that 90% of the patients had undergone only 4 of the 9 RSSDI recommended screening. The other parameters had been carried out in only among 40 to 60% of the patients. Thus, primary care physicians have to emphasize on the subtle but important criteria like ophthalmic examination, peripheral neuropathy and microalbuminuria during regular outpatient visits.

Keywords: Clinical audit, diabetes care, macrovascular, microvascular complications, outpatient care

Introduction

Clinical audit is defined as "the systematic review of elements of clinical care against predetermined criteria, with the aim of identifying areas for improvement and then developing, implementing and evaluating strategies intended to achieve that improvement."[1] The steps of a standard clinical audit are described in Figure 1.

As per statistics from the International Diabetes Federation (IDF) 2019, India has about 62 million diabetics; the second largest number worldwide, which has affected all age groups. Data also shows an increase in prevalence of diabetes over the past 13 years by approximately 10 million cases, making us the "diabetes capital" of the world.[2] The disease and its complications impose a significant economic impact for individuals and their families, as well as the country's healthcare.[3,4]

Poor glycemic control can hasten the micro and macro-vascular changes predisposing to serious complications.[5] Moreover, the combination of augmented coagulability and impaired fibrinolysis further increases the risk of vascular and CV events.[6]

A recent study reported that longer duration of the disease worsened most complications. Neuropathy was noted as the commonest problem, followed by cardiovascular disease, nephropathy, retinopathy and foot ulcers.[7]

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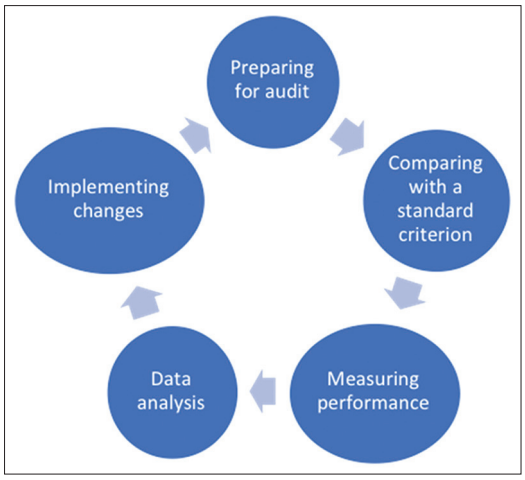


Figure 1: The audit cycle

Primary care physicians are the first point of contact and sometimes the only treatment provider for majority of the patients, especially in rural India. Hence there is a need for awareness among these treating physicians on systematic screening programs to identify the undiagnosed cases, and take quick preventive and therapeutic interventions. WHO also strongly recommends implementing Diabetic care programmes[8] in low- and middle-income countries for the surveillance.

Indians as a race are known to be more prone to glycemic variability in their lifetime. The high susceptibility of Indian population to diabetes is attributed to many factors.[9]

1. Genetic factors – Indians have fourfold increased likelihood to develop diabetes than Europeans because of genetic predisposition
2. Cultural and social factors – The typical high carbohydrate Indian diet loaded with saturated fat leads to obesity and diabetes
3. Lifestyle change due to urban transition - sedentary life and consumption of processed sugary foods has increased due to the higher standards of living
4. "Asian phenotype" in diabetes[10] – is a recognized entity characterized by low body mass index, high abdominal adiposity and younger onset DM leading to incidence of higher cardiovascular disease in South Asia, and stroke in East Asia.

RSSDI is an Indian committee of healthcare professionals and is the largest Asian organization for diabetes-related research. The committee recommends 9 parameters for routine monitoring as a standard of diabetic care which has been adopted in this study.

Aims and Objectives

Aim

This audit was done to evaluate the level of assessment of non-glycemic parameters in type 2 diabetic patients by the treating physician in an outpatient setting.

Objectives

- To observe if screening methods for micro and macrovascular complications are used routinely in diabetic patients
- To look for lacunae in the screening for preventable complications.

Materials and Methods

This cross-sectional observational study was done from December 1 to December 31, 2019. Formal approval was obtained from the hospital management and ethical committee before commencement of the study. Patients' folders were randomly selected for review and nine clinical parameters as per the RSSDI guidelines[11] were selected for the audit. The criteria included:-

- Complete history and Physical examination on every visit
- Ophthalmic examination-every 2 years
- Counseling for smoking cessation-every visit
- BP measurement-every visit
- Lipid Measurement-at diagnosis, at age 40 and 6th monthly
- Screening for CVD (not conventionally recommended)
- Micro albuminuria-at diagnosis and annually
- Assessing for distal peripheral neuropathy-at diagnosis and annually
- Providing comprehensive foot care-at diagnosis and annually.

Each physician from the department of medicine and family medicine was referred to as "units" with numbers allotted to them on a random basis.

Inclusion criteria

All patients aged 18-65 years with more than one year of Type 2 DM presenting to OPD for routine checkup.

Exclusion criteria

- Patients with life threatening acute illnesses
- Patients with preexisting micro or macrovascular sequel
- Type 1 DM and complications
- Gestational diabetes
- Patients with less than 1 year of diabetes as most of the criteria adopted from RSSDI required yearly follow up.

The assessment of each parameter by the physician during each of the previous and current visits was scored from the outpatient chart.

Descriptive statistical analysis was carried out. The mean percentage values of the nine medical units achieved per diabetic parameter were calculated and tabulated.

Results

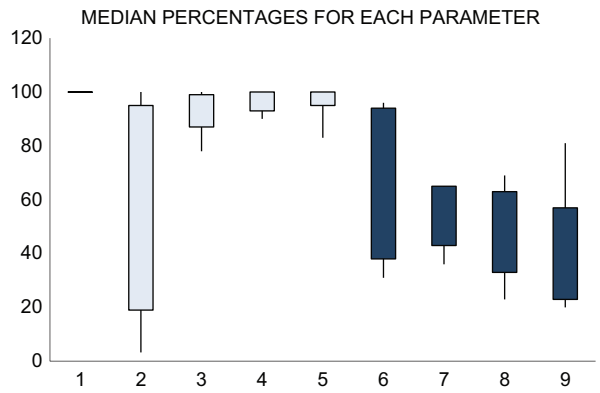
The diabetic care given by each medical unit for each parameter in percentage is described in Table 1.

Box plot graph of median percentages achieved for each parameter. The graph shows percentages on yaxis and xaxis

Table 1: Results from the audit expressed in percentages

	Parameter achieved in percentage									
Consultant/Unit	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Total**
Parameters										
Complete history and Physical annually	100	100	100	100	100	100	100	100	100	100
Ophthalmic examination-every 2 years	36	81	40	100	87	26	6.3	100	3.3	57.1
Smoking cessation-every visit	94	100	88	95	92	78	94	100	93	93.3
BP measurement-every visit	97	100	96	90	100	100	100	100	100	98.4
Lipid Measurement-at diagnosis, at age 40 and 6 monthly	97	100	92	100	100	96	100	100	83	96.5
Screening for CVD	70	83	48	65	61	35	31	97	33	61.4
Microalbuminuria-at diagnosis and annually	61	44	52	60	66	39	63	67	37	54.3
Distal peripheral neuropathy-at diagnosis and annually	48	64	36	60	50	30	50	70	23	48.8
Comprehensive foot care-at diagnosis and annually	42	36	36	40	42	26	31	82	20	40.9

Table 2: Box plot graph



describes the nine parameters numbered from 1 through 9. The lower limit of box plot represents the minimum level of performance and the upper limit being the maximum level of performance. However for example in the first plot, the upper limit and the lower limit are at 100% as all the physicians have performed the first recommendation at a level of 100% [Table 2].

The results showed a 100% score in complete history and examination with all physicians documenting them. The mean score for ophthalmic examination with a fundoscopy was 57.1% with the highest score at 100% and lowest at 3.3%; some physicians insisting and referring for ophthalmic examination periodically while some totally neglecting the need for it. Mean was 93.3% in counseling for smoking cessation at every visit with the highest score being 100 and lowest being 78%, whereas it was 98.4% in blood pressure measurement with highest percentage score of 100 and lowest being 90. Lipid profile measurement had an average score of 96.5% with highest and lowest scores being 100% and 83% respectively. The score for the screening for cardiovascular system with a routine electrocardiograph was 61.4% in the audit with the highest score at 97% and lowest at 31%. Screening for microalbuminuria at diagnosis and annually was done only in 54.3% of patients on average with the highest at 67% and lowest at 37%. Further, checking for peripheral neuropathy scored at 48.8% with the highest and lowest scores being 64% and 23%. Lastly comprehensive foot care scored 40.9% with the highest value at 82% and lowest value at 20%.

Discussion

This study showed that only 4 parameters out of 9 recommended by RSSDI were well addressed by treating physicians while the remaining ignored by many.

The ADA [American Diabetic Association] recommends sleep studies too as a part of the clinical workup in diabetics based on emerging evidence of a relationship between the two. There is also added evidence on including autoimmune diseases, HIV, anxiety disorders, depression, eating disorders, and serious mental illness to the list.[12]

Clinical audits help in scrutinising healthcare institutes and in identifying the inadequacies in patient management. Conducting audits and improvements based on them are found to be feasible even in resource-limited settings.[13]

In 2012, a clinical audit conducted on diabetes management in a primary care setting in Cape Town showed the baseline screening for six out of nine parameters were below 50%. These findings were very similar to the audit done at our setting. Improved outcomes were noted after interventions with support from the relevant government and staff.[14]

A similar Audit was done at Al-Ain, United Arab Emirates to improve their clinical practice. The study involved a baseline audit followed by similar ones at 3rd and 6th month. Improved glycemic – BP control and patient satisfaction was observed after the repeated audits.[15]

In 2017, an Indian study was conducted to estimate the costs of treatment of long-term diabetic complications of DM. On an average, two or more complications resulted in a significant financial burden to the patient with foot and cardiovascular ones being the most significant costing approximately 19020 INR yearly; going up to four times more with two or more complications and hospitalizations.[16] It is therefore vital to

emphasize the need for preventive measures for diabetes and its complications. Introduction of diabetes flow-sheets where past diabetic history is documented and recorded, educational material for patients regarding the complications of diabetes and increasing awareness among patients and physicians would reduce the diabetes related morbidities and mortalities.[17]

Similar to many studies conducted worldwide, our audit also showed key parameters being ignored or sidelined by treating doctors. The proposed reasons for the non-assessment of certain important criteria by the physicians could include:

1. Less doctor – patient time: Due to large number of patients seen by a physician per day.
2. Patients refusing few investigations because they are asymptomatic or having financial constraints.
3. Lack of a dedicated diabetic clinic in the OP.
4. Common OP history sheet with no specific columns for parameters that need to be routinely evaluated in a diabetic patient.
5. Lack of a standard protocol for a systematic follow-up.

Limitations of the study

This is a baseline clinical audit and subsequent clinical audits need be carried out to assess the progress in the quality of care. The same audit needs to be then extended to the primary health care setting as well. Moreover the current audit may not be the complete reflection of assessment of all parameters since documentation of few essential data may be missed during consultations in a busy OPD.

Recommendations

- To urge patients to take up ophthalmic examination, micro albuminuria detection as well as complete foot examination during their routine healthcare visits.
- To plan an exclusive set-up for streamlined protocol based routine care of diabetic patients separated from their non-diabetic emergent visits.
- To educate doctors, patients and their care-givers "to look beyond sugar control"
- Special training courses to ensure that physicians do not miss out on assessment parameters.
- Funding for comprehensive DM health clinic
- To conduct periodic audits for assessing the change in quality of care.
- To standardise the management and follow-up goals ensuring uniformity in terms of diabetic care and its associated complications.
- National Institute for Health and Care Excellence along with American Association of Clinical Endocrinologists and American College of Endocrinology have recommended several guidelines ensuring the same.[18]
- To incorporate psychosocial and economic factors into the therapy, thereby personalizing the treatment plan for the patient. Many studies have shown that a higher level of patient satisfaction can enhance treatment compliance.[19]

Conclusion

This clinical audit highlighted that all non glycemic parameters were not equally considered by the treating physicians in the management of diabetic patients.

There is a compelling need to educate the doctors and patients about relevant screening to prevent long term and short-term complications. Since family physicians are the main healthcare providers in India, this aspect needs to be asserted among them for a healthier diabetic population.

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Conflicts of interest

There are no conflicts of interest.

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