Early detection of diabetic in emergency sittings: A narrative review

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KEYWORDS

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ABSTRACT

Diabetes mellitus (DM) is a chronic metabolic disorder can lead to life-threatening emergencies , Diabetes mellitus characterized by hyperglycemia due to defective insulin secretion, insulin action, or both and Early detection and management of diabetes are crucial to prevent complications such as cardiovascular disease, neuropathy, retinopathy, and nephropathy, which contribute significantly to morbidity and mortality, Common Diabetic Emergencies Diabetic Ketoacidosis (DKA) like Insulin deficiency, hyperglycemia, ketosis and acidosis , Hyperosmolar Hyperglycemic State (HHS) like Severe hyperglycemia and dehydration ,Hypoglycemia that are Imbalance of insulin, food intake, and activity levels ,This narrative review aims to explore the importance, challenges, and strategies for early detection of diabetes in emergency settings

INTRRODUCTOIN

Diabetes mellitus (DM) is a global health concern, affecting over 463 million adults worldwide as of 2019, with projections estimating a rise to 700 million by 2045[1],This chronic metabolic disorder, characterized by hyperglycemia resulting from insulin deficiency, insulin resistance, or both, is associated with significant morbidity and mortality due to both acute and chronic complications. Acute complications, such as diabetic ketoacidosis (DKA), hyperosmolar hyperglycemic state (HHS), and severe hypoglycemia, are life-threatening conditions that frequently present in emergency settings. Chronic complications, including cardiovascular disease, neuropathy, retinopathy, and nephropathy, further underscore the importance of early detection and intervention,emergency departments (EDs) often serve as the first point of contact for individuals with undiagnosed diabetes or those experiencing acute complications. Studies suggest that up to 30% of individuals with type 2 diabetes remain undiagnosed, and many first present to healthcare systems with acute complications [2]. Early detection of diabetes in emergency settings is therefore critical for preventing life-threatening complications, reducing hospital admissions, and improving long-term outcomes through timely initiation of treatment and lifestyle modifications.

Methodology

This narrative review was conducted to explore the current evidence and best practices for the early detection of diabetes in emergency settings. A narrative review methodology was chosen to provide a comprehensive and flexible synthesis of the literature, allowing for the inclusion of diverse study designs and perspectives, A systematic search of electronic databases, including PubMed, MEDLINE, Embase, and Google Scholar, was conducted to identify

relevant studies published in English. The search was limited to articles published between 2003 and 2023to ensure the inclusion of recent advancements and guidelines, Kyes items Early detection of diabetic, diabetes mullets , emergency sittings , narrative review .

LITERATURE REVIEW

1. Importance of Early Detection in Emergency Settings

Emergency departments (EDs) often serve as the first point of contact for individuals with undiagnosed diabetes or those experiencing acute complications. Early detection in these settings can ,prevent life-threatening complications,facilitate timely intervention and management,Reduce hospital admissions and healthcare costs and Improve long-term outcomes through early initiation of treatment and lifestyle modifications.

2. Challenges in Early Detection

- **Atypical Presentations:** Symptoms of diabetes (e.g., polyuria, polydipsia, weight loss) may be overlooked or attributed to other conditions.
- **Overlapping Symptoms:** Fatigue, dehydration, and altered mental status, common in emergencies, can mask underlying diabetes.
- **Lack of Routine Screening:** Emergency settings prioritize acute care, and routine screening for diabetes is often not a standard practice.
- **Resource Limitations:** Limited access to diagnostic tools (e.g., HbA1c testing) in some emergency settings can delay diagnosis.

3. Strategies for Early Detection

a. Clinical Suspicion

- **High-Risk Populations:** Identify individuals at higher risk for diabetes, such as those with obesity, family history of diabetes, or a history of gestational diabetes.
- **Red Flags:** Be vigilant for symptoms like unexplained weight loss, recurrent infections, or persistent fatigue.

b. Point-of-Care Testing (POCT)

- **Blood Glucose Testing:** Rapid assessment of capillary blood glucose levels can identify hyperglycemia or hypoglycemia.
- **HbA1c Testing:** Portable devices for HbA1c measurement can provide insights into long-term glycemic control, aiding in the diagnosis of diabetes.

c. Laboratory Investigations

- **Random Plasma Glucose (RPG):** Levels ≥200 mg/dL (11.1 mmol/L) with symptoms of hyperglycemia can indicate diabetes.
- **Fasting Plasma Glucose (FPG):** Levels ≥126 mg/dL (7.0 mmol/L) suggest diabetes.
- **Oral Glucose Tolerance Test (OGTT):** Although less practical in emergencies, it can be used in select cases.

d. Use of Clinical Decision Tools

- **Risk Scores:** Tools like the Finnish Diabetes Risk Score (FINDRISC) or the American Diabetes Association (ADA) risk test can help identify individuals at risk.
- **Electronic Health Records (EHRs):** Integration of diabetes risk assessment tools into EHRs can prompt clinicians to consider diabetes in at-risk patients.

4. Acute Presentations of Undiagnosed Diabetes

- **Diabetic Ketoacidosis (DKA):** Characterized by hyperglycemia, ketosis, and metabolic acidosis. Early recognition involves assessing for symptoms like nausea, vomiting, abdominal pain, and altered mental status.
- **Hyperosmolar Hyperglycemic State (HHS):** Presents with severe hyperglycemia, dehydration, and altered consciousness. Often seen in older adults with type 2 diabetes.
- **Hypoglycemia:** May occur in individuals with undiagnosed diabetes due to erratic eating patterns or insulin misuse.

5. Role of Multidisciplinary Teams

- **Collaborative Care:** Involving endocrinologists, nurses, and dietitians can improve early detection and management.
- **Patient Education:** Educating patients about diabetes symptoms and risk factors can encourage early presentation and diagnosis.

6. Future Directions

- **Artificial Intelligence (AI):** AI algorithms integrated into EHRs can analyze patient data to identify individuals at risk for diabetes.
- **Community Partnerships:** Linking emergency settings with community health programs can facilitate follow-up care and diabetes screening.
- **Public Awareness Campaigns:** Increasing awareness about diabetes symptoms and the importance of early detection can reduce delays in diagnosis.

Conclusion

Early detection of diabetes in emergency settings is critical for preventing complications and improving outcomes. While challenges exist, a combination of clinical suspicion, point-of-care testing, and risk assessment tools can enhance early diagnosis. Multidisciplinary collaboration and the integration of advanced technologies hold promise for further improving early detection efforts. Emergency departments play a pivotal role in identifying undiagnosed diabetes and initiating timely interventions, ultimately reducing the burden of this chronic condition.

References

1. International Diabetes Federation. (2019). IDF Diabetes Atlas, 9th Edition. Brussels, Belgium: International Diabetes Federation. https://www.diabetesatlas.org
2. American Diabetes Association. (2021). Standards of Medical Care in Diabetes—2021. *Diabetes Care*, *44*(Supplement 1), S15–S33. https://doi.org/10.2337/dc21-S002
3. International Diabetes Federation. (2019). IDF Diabetes Atlas, 9th Edition. Brussels, Belgium: International Diabetes Federation. https://www.diabetesatlas.org
4. Kitabchi, A. E., Umpierrez, G. E., Miles, J. M., & Fisher, J. N. (2009). Hyperglycemic Crises in Adult Patients With Diabetes. *Diabetes Care*, *32*(7), 1335–1343. https://doi.org/10.2337/dc09-9032
5. Pasquel, F. J., & Umpierrez, G. E. (2014). Hyperosmolar Hyperglycemic State: A Historic Review of the Clinical Presentation, Diagnosis, and Treatment. *Diabetes Care*, *37*(11), 3124–3131. https://doi.org/10.2337/dc14-0984

6. Savage, M. W., Dhatariya, K. K., & Kilvert, A. (2011). Joint British Diabetes Societies Guideline for the Management of Diabetic Ketoacidosis. *Diabetic Medicine*, *28*(5), 508–515. https://doi.org/10.1111/j.1464-5491.2011.03246.x
7. World Health Organization. (2006). Definition and Diagnosis of Diabetes Mellitus and Intermediate Hyperglycemia. https://www.who.int/diabetes/publications/diagnosis_diabetes2006/en/
8. Lindström, J., & Tuomilehto, J. (2003). The Diabetes Risk Score: A Practical Tool to Predict Type 2 Diabetes Risk. *Diabetes Care*, *26*(3), 725–731. https://doi.org/10.2337/diacare.26.3.725
9. Nyenwe, E. A., & Kitabchi, A. E. (2016). The Evolution of Diabetic Ketoacidosis: An Update of Its Etiology, Pathogenesis, and Management. *Metabolism*, *65*(4), 507–521. https://doi.org/10.1016/j.metabol.2015.12.007
10. Fayfman, M., Pasquel, F. J., & Umpierrez, G. E. (2017). Management of Hyperglycemic Crises: Diabetic Ketoacidosis and Hyperglycemic Hyperosmolar State. *Medical Clinics of North America*, *101*(3), 587–606. https://doi.org/10.1016/j.mcna.2016.12.011
11. Inzucchi, S. E., Bergenstal, R. M., Buse, J. B., et al. (2015). Management of Hyperglycemia in Type 2 Diabetes, 2015: A Patient-Centered Approach. *Diabetes Care*, *38*(1), 140–149. https://doi.org/10.2337/dc14-2441
12. Powers, M. A., Bardsley, J., Cypress, M., et al. (2015). Diabetes Self-Management Education and Support in Type 2 Diabetes: A Joint Position Statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. *Diabetes Care*, *38*(7), 1372–1382. https://doi.org/10.2337/dc15-0730
13. Kavakiotis, I., Tsave, O., Salifoglou, A., et al. (2017). Machine Learning and Data Mining Methods in Diabetes Research. *Computational and Structural Biotechnology Journal*, *15*, 104–116. https://doi.org/10.1016/j.csbj.2016.12.005
14. Ali, M. K., McKeever Bullard, K., Imperatore, G., et al. (2012). Characteristics Associated With Poor Glycemic Control Among Adults With Self-Reported Diagnosed Diabetes—National Health and Nutrition Examination Survey, United States, 2007–2010. *MMWR Morbidity and Mortality Weekly Report*, *61*(2), 32–37. https://www.cdc.gov/mmwr/preview/mmwrhtml/su6102a7.htm