

Management of diabetes during natural emergencies

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ABSTRACT

Disaster preparedness is an important but often a neglected part in the management of chronic disorders. India is facing an epidemic of diabetes and the patients with diabetes are also exposed to the risk of natural disaster along with other members of the society. India faced many disasters in the past including the Bhopal gas leak, Gujarat earthquake and Andaman tsunami. These disasters exposed the lacunae in the disaster preparedness and lead to devastating health consequences. Previous research focused more on the immediate, traumatic aspects of the disasters and neglected the impact on chronic disorders. The experience of managing diabetes after Hurricane Katrina gave important insights into the short and long term consequences of a disaster. Our article provides information about the impact of disasters on diabetes, difficulties in the management and suggested measures at various levels to improve the disaster preparedness.

Key words: Disaster preparedness, natural emergencies, type 2 diabetes

INTRODUCTION

India is facing an epidemic of diabetes and the estimated number of confirmed diabetes patients in India is 67 million. Another 30 million individuals are in the prediabetes group and by 2030, India will have the largest number of diabetes patients in the world.^[1] Diabetes is a chronic disorder characterized by hyperglycemia and is frequently associated with other metabolic abnormalities like hypertension and dyslipidemia. These disorders require regular medical therapy and disruption of such therapies can have serious consequences on health and economy in both the short term and long term. The large numbers of diabetes patients in the society expose them to the additional risk of natural disasters and weather emergencies as applicable to other population.

A disaster is defined as an event that causes “disruption exceeding the adjustment capacity of the affected community”. Disasters by their nature tend to be sudden in onset and independent of the control of individuals. A recent report from India suggest that more than 85% of disasters occur in the developing world but they contribute to less than 1% in the literature on the disaster related research.^[2] The disaster preparedness requires close interaction between individuals, community and administrative authorities at each level. Community resilience requires measures to protect and enhance the lives and assets during a stressful situation.^[3] Recent report after Mumbai terrorism attack highlights the resilience of the community as a critical measure to limit the damaging effect of the disaster.^[4] This involves strengthening the people to absorb all types of shocks and stresses and also develops a tailor made solution based on the understanding about the responses of these individuals.

People with chronic medical conditions that require daily medications are among the most vulnerable victims of natural disasters. This is because of the disruption in regular food intake, medical supplies and lack of health care facilities. People with diabetes can have serious impact of natural disaster owing to the additional risk factors like stress induced hyperglycemia, erratic meal timings

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and proneness to infection as witnessed in the aftermath of Hurricane Katrina.^[5-7] The lack of proper medical records poses big problem for those in the shelters as the medications used have to be based on patient memory and knowledge. Individuals have to adjust to the replacement medicines available in the shelters which may not match to the exact schedule of the patient. Advanced planning is the key to tackle the natural disaster as the time available is very limited. We review the subject of diabetes disaster preparedness in this article and propose few guidelines for the help of people to plan ahead of time. The suggested diabetes disaster plan can be applied to all natural disasters like tsunami, earthquake, tornado and can be modified for all chronic medical conditions.

Impact of natural disasters on diabetes

Emergency situations occur worldwide and the damage caused by disasters seems to get worse. In a country like India with huge population and limited resources, the catastrophes create a situation where simple survival is a major concern. Despite the best planning, many aspects of the health care system are interrupted in a disaster. There are a limited number of studies available which explored the impact of natural disasters on diabetes.

Hurricane Katrina was the deadliest cyclone in the history of the United States. This cyclone occurred during August 2005 and was responsible for about 2000 fatal casualties and enormous damage to the health systems. An observational study involving 1,795 adults showed that the blood pressure, HbA1c and lipid parameters worsened after the Hurricane Katrina.^[8] Another study suggested that HbA1c, BP and LDL cholesterol showed significant patterns of change during the follow up period.^[9] An observational study involving 58 type 1 diabetes patients also suggested that the previous metabolic control is a predictor of subsequent control and the fear of hypoglycemia is a major risk factor for poor metabolic control.^[10] The disruption also extends to the clinical trials and the experience with the major trial ACCORD identified the difficulties in conducting the trial to maintain the patient follow up and scientific integrity of the trial after a disaster.^[11]

Diabetes disaster plan

It is essential to be prepared, before a disaster is struck. The preparation is important at all levels of health care for the individual patient, health care workers and the administrative authorities. Hence, certain broad guidelines are required for the health care organizations, health care professionals, and people with chronic diseases like diabetes. A survey carried out to assess the emergency preparedness of families caring for type 1 diabetes patients revealed interesting findings.^[12] Most of the families had

adequate medical supplies for 3 days and the families from higher socioeconomic strata were better equipped for an emergency. The emphasis is on better preparation at various levels of health care systems to tackle the diabetes in case of a natural disaster. Figure 1 describes the salient features of the diabetes disaster plan at the individual end and also the contents of the diabetes disaster kit and special advice for insulin requiring patients. All the patients are advised to have an individual plan, maintain an emergency kit and practice a family drill of emergency.

The enhanced state of preparation and responsiveness is also essential for health care workers and the administrators or policy makers. The key points highlighted by all the scientific societies are to identify the diabetes status of the patient, ensure adequate hydration, frequent checking of blood glucose, prevent hypoglycemia and ensure the intake of regular medications. American Diabetes Association (ADA) has constituted a disaster response task force for the recommendations on the subject after the experience with the Hurricane Katrina.^[13,14] The suggested recommendations in this article have been guided by the task force report.

Indian scenario

Despite falling prey to natural disasters like the 2001 Gujarat earthquake and the Tsunami in Andaman and Nicobar islands in 2004, India is still not prepared against any natural calamity.^[15] Realizing the importance of the subject, the government had set up a National Disaster Management Authority (NDMA) in 2005. The progress achieved by India

<p>Important information for patients including Do's and Don'ts</p> <ul style="list-style-type: none"> • Stress of disaster can elevate glucose • Erratic meal timings and excess physical strain may alter the blood glucose • Glargine and Regular insulin are clear in appearance and others are milky • Glucometer readings may not be accurate due to heat and humidity • Insulin and pen devices can be stored at room temperature for 28 days • Inform the doctors about your health condition and the medications • Carry an emergency health information card with details of the medications • Seek emergency treatment in case of weakness, nausea, vomiting & fever • Always wear protective clothing & protective foot wear • Avoid physical injuries • Maintain regular meals and adequate hydration • Examine feet daily and if exposed to flood waters, clean them immediately • Eat extra food with excess physical exertion to prevent hypoglycemia • Try and boil the water before drinking • Monitor the blood sugar frequently • Obtain education about diabetes self management and stress management 	<p>For insulin requiring patients</p> <ul style="list-style-type: none"> • Keep gel packs for transfer of insulin • Keep small cooler bag for insulin • Keep all injections, needles, syringes together for easy retrieval • Keep glucose powder and biscuits • Check for the expiry dates regularly • Avoid exposure of insulin to excessive heat, light, cold • Check for clumping before usage <p>Diabetes Disaster Kit</p> <ul style="list-style-type: none"> • Information sheet about diabetes • Current medicines and dosages • Key contact numbers • Comforted ailments and past surgeries • 30 day supply of all medicines • Glucometer with atleast 50 strips • Glucose, biscuits and food items • Gel packs for patients using insulin • Should be insulated and water proof
<p>Advice for Health Care Workers</p> <ul style="list-style-type: none"> • Explain the importance of diabetes management during stress and natural disasters • Work with the patient to build a disaster kit • Check the contents of the disaster kit regularly • Assist the survivors of disaster by teaching them about CPR, First aid measures etc • Conduct regular classes on community disaster education 	
<p>Advice for Health Administrators</p> <ul style="list-style-type: none"> • Ensure that people are registered with the local health care teams • Create a list of volunteers willing to help in case of emergency • Provide information and resources for the people with diabetes • Cater for all communities living in the society with regional specific brochures • Create a network of government and non government organizations engaged in the relief work to ensure better coordination, communication and emergency response • Develop a citywide emergency plan and educate the public about the same • Provide appropriate information on public media like radio, TV etc • Liaise with the medical industry and get uninterrupted supply of medicines required • Identify and prioritise the food delivery programmes to diabetes patients 	

Figure 1: Diabetes disaster preparedness guidelines for Patients, Health Care Workers and Administrators

is seen by the limited number of casualties after the massive evacuation efforts in the state of Orissa prior to cyclone Phailin. A population study from India has revealed higher prevalence of stress and hyperglycemia in patients affected by the tsunami.^[16] The clinical profile of hyperglycemic emergencies from the pilgrimage yatra to Amarnath shrine also revealed similar findings.^[17] High altitude, strenuous exertion, starvation and withdrawal of the existing drugs are the main contributors for the hyperglycaemic emergencies.

The authors had the first hand experience of managing the casualties after the Bhuj earthquake. The important problems identified in relation to the diabetes include lack of health information cards, stress induced hyperglycemia, mismatch between the medical supplies (insulin without syringes, U-100 syringes with 40 IU/ml vial of insulin etc.), lack of cold chain facilities and supply of expired medicines. The other important problems are lack of awareness and education about the disease and medications, lack of facilities for regular monitoring and erratic food supplies to the hospital wards.

CONCLUSION

Every disaster is a learning experience and the same applies to the preparedness in case of diabetes also. Previous disasters like Gujarat earthquake, Hurricane Katrina and Cyclone Phailin have given us enough experience to handle a natural disaster. The patient education and physician participation are essential for good diabetes management during a natural disaster. The medical community should lead from the front in case of any natural disasters and help the policy makers in organizing the relief work. Logistic support and regular supply of the food material are the key areas of concern after a disaster. Disaster preparedness should be included in the medical teaching curriculum and also in the patient information leaflets.

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