Breastfeeding should be initiated within 30 minutes after birth and should be provided every 2 and 3 hours to avoid neonatal hypoglycemia, chances of which are maximum in the initial 24 hours after birth. Exclusive breastfeeding for 6 months and continuation till 2 years (with addition of complementary feeds after 6 months) should be encouraged. Medicines for the treatment of diabetes related complications and co-morbidities that were discontinued for safety reasons before or during pregnancy should be avoided during breastfeeding period also. The importance of good glycemic control to reduce future diabetes related complications and need for contraception to avoid unplanned pregnancies should be advocated. Lifestyle advice should be given after birth. Women should be monitored for diabetes related complications (especially diabetic retinopathy), thyroid status and mental status (depression) which may worsen in the first year after childbirth.

Summary

T1DM is associated with a higher risk of adverse pregnancy outcomes. In view of the strong link between poor glycemic control and adverse pregnancy outcomes, achieving normal or near normal glucose levels before and during pregnancy is important to optimize pregnancy outcomes. In addition, early recognition and care of associated complications like nephropathy, retinopathy and co-morbidities like hypertension is essential for improving pregnancy outcomes. Psychological assessment and referral to psychiatrist/psychologist if required should also be a part of preconception to postpartum care.

Section B- Travel

Introduction

Traveling either for work, leisure, or family functions/meetings is an essential component of life. Individuals with type 1 diabetes mellitus (T1DM) often face difficulties in multiple aspects while traveling. This document intends to present information, which is vital for a patient with T1DM while traveling.

Pre-travel advice and preparation

1. The patient should inform the physician in advance, preferably 4-6 weeks before the planned travel. Provide education and access patient's understanding regarding insulin storage, dose adjustment, hypoglycemia care, and sick day rules.
2. The physician should provide the patient with a legible prescription containing all details on medicines and blood testing materials like a glucose meter, lancet, and batteries. Some patients may require a specific travel letter.
3. The glycemic control should be adequate and appropriate change in insulin type/dose should be done, keeping in mind the travel schedule.
4. The patient should have medications and blood testing materials for the whole trip and should have reserve supplies for at least 2 to 4 weeks if unforeseen circumstances extend the travel.
5. Advise the patients to carry glucose meters (preferably two, if one malfunctions during travel) and an adequate number of batteries, glucose testing strips, ketone strips, logbooks, glucose tablets, and glucagon injection.
6. The patients on continuous glucose monitoring system (CGMS) and insulin pumps should carry all the supplies required for the devices' proper functioning. They

should also carry an insulin pen/syringes and cartridges/ vials in case the insulin pump malfunctions.

7. The patient should also be aware of the different strengths of insulin and different types of insulin syringes. Teach them regarding the appropriate insulin conversions. For example, if someone takes 20 units of regular insulin from a vial of 40 IU/ml but traveling abroad only can get a syringe with calibrations in terms of 100 IU/ml, they have to take insulin till the 50 units more of the 100 IU/ml syringe.
8. Instruct the patient to keep original labels of medicines and supplies as far as possible
9. A prescription of drugs for some common ailments like fever, emesis, diarrhea, and a first aid kit will help the patient.
10. Depending upon the region of travel, one may require specific vaccines.
11. Advise carrying comfortable shoes and socks to avoid straining the feet while on travel. The patients should avoid walking barefoot. Alternating between two pairs of shoes can decrease the risk of blisters and calluses. New shoes, if purchased, should be used for at least 2 to 3 weeks before travel.
12. Provide patients with a medical identification bracelet with information on the disease, use of insulin, and disclose any allergies.
13. Valid travel insurance should be ensured for international travel.

General information during travel

1. The patients should keep the medications and supplies in hand baggage and should keep this bag in their possession.
2. They should keep some supplies (which are not affected by temperature and pressure changes) in alternative baggage, which will help if the hand baggage is stolen or misplaced.
3. The patients should keep insulin between 4°C–30°C. In case the outside temperature is > 30 degrees Celsius, the insulin vial/cartridge should be kept in a plastic bag and tied from above. Instruct the patient to keep the plastic bag in a wide mouth bottle with ice cubes. The patients should carry their insulin with them at all times and not store it in a car glove compartment or backpack. Excessive sunlight may damage the insulin. The cold pack is a helpful alternative to refrigeration. During the stay at places where the refrigerator is not available, an earthen pitcher filled with water and kept at a cool place can be an alternative.

Specific instructions during air travel

Before boarding

1. The patient can inform the airline beforehand regarding their diabetes status, the medicines, and materials that they will carry with them. They should also be aware of the process of obtaining assistance like facilitated check-in or navigating through security checks and hypoglycemia care if needs arise.
2. Patients should pack their insulin and diabetes-related medications/equipment and the medical prescription in a separate bag, which will help them navigate security checks with ease. They should arrive well in advance, preferably three hours before scheduled departure giving them time to tackle any difficulty arising during check-in.

They should have ready measures to correct hypoglycemia if it happens. The measures to correct hypoglycemia should preferably be in solid form as there are restrictions to carry liquid beyond a specific limit at many airports. They should also be familiar with the regulations on check-in, including security checks (airport website or other means).

3. The insulin should be kept in hand baggage as it can get damaged due to extreme temperature and air pressure (during air travel) if kept in check-in baggage, though the ice packs can be kept in check-in baggage for later use after air travel.
4. In case the patient is using an insulin pump or CGMS, one should check with the manufacturer regarding their compatibility with traditional metal detectors and Advanced Imaging Technology (AIT) scanners. In case the devices are not compatible, one should inform regarding the problem and request the security officer alternative means of checking like a manual check-up.
5. The patients who have language problems should have cards or other means to communicate that they have diabetes, these are their medications, what to do if they have hypoglycemia. It will be helpful to teach simple phrases like "I have diabetes," "my sugar in the local language is going down," "and these are my medications," and "please give me some juice."
4. Patients with diabetes need to be aware of how different foods can affect their diabetes control. One should find out about the foods common to the local cuisine. Advise patients to actively monitor how their blood glucose is affected by new foods by checking blood glucose levels before and after each meal. Opting for vegetables and protein sources minimizes glucose fluctuations. Patients with celiac disease should specifically mention gluten-free diets while on air travel or should carry the appropriate food. Similarly, they should be vigilant regarding gluten-free food in situations other than air travel.

In-flight

5. During travel, it will be helpful to check blood glucose every 4 hours.
6. If patients inject insulin while in flight, one must be careful not to inject air into the insulin bottle. In the pressurized cabin, pressure differences can cause the plunger to "fight you," making it hard to measure insulin accurately.
7. Patients should always carry snacks and supplies to treat hypoglycemia. It is also safe to carry some food along even if traveling by air. It will also be helpful to make fellow passengers or crew members aware of their diabetes status so that they can help in the correction of hypoglycemia in case the need arises.
8. Also, be aware of the serving time of meals and snacks and put a request to serve as per personal schedule to avoid fluctuations in glucose due to perturbed schedule.
9. Do not keep sitting in one place, especially on long flights, and should keep exercising the feet and stand/walk intermittently.
10. Do not indulge in alcohol or caffeine-rich beverages.

After landing

11. The patient should check their blood glucose level as soon as possible after landing. Jet lag can make it hard to tell if one has very low or very high blood glucose.

Insulin adjustments during air travel

1. Diabetes management depends on a 24-hour medication schedule, and medication adjustments are needed only when the patient is traveling east or west, not north or south. Traveling east results in a short day, and requires a potential reduction in insulin. Traveling west increases the day length, possibly requiring an increase in insulin dose. The insulin adjustments are usually required if crossing more than five time zones and staying for more than three days abroad.
2. In general, the dose is reduced by 10% to reduce the risk of hypoglycemia during travel, especially if the glucose values are within the target range.
3. Dose adjustment while traveling east: Adjust the basal dose using the formula. Travel Dose = Normal Dose X [0.9- (Difference in time zones/Hours between basal doses)]

For example, a patient is on 30 units Glargine, which he takes at 8 pm. He is traveling from Dubai to Sydney. The flight is at 11 pm (Dubai time), and the flight distance is 13 hours. The arrival time will be noon Dubai and 6 pm Sydney time. Therefore calculate the travel dose as 30 X [0.9-(6/24)], which will be 19.5 units. He will inject 19 units at 8 pm, before flying and will resume his regular dose of 30 units at 8 pm Sydney time. If the patient is taking 18 units, Detemir at 8 am and 12 units at 8 pm. Then he will take both his scheduled doses before travel. He should keep Dubai time on the watch, and in-flight morning dose will get modified as 18 X (0.9-6/12), which will be 7.2 units. He will take seven units at 8 am as per Dubai time and will take a scheduled dose of 12 units at 8 pm Sydney time.

Example of dose adjustment while traveling west: a patient is on 30 units Glargine, which he takes at 8 pm. He is traveling from Sydney to Dubai. The flight is at 11 pm (Sydney time), and the flight distance is 13 hours. The arrival time will be 6 am in Dubai and noon Sydney time. Therefore, calculate the travel dose as 30 X [0.9- (-6/24)] = 34.5 units. So he can split his dose and take 50% of the dose at 8 pm before flying and can take 50% of the dose at 8 am as per Sydney time. This will provide coverage for over 12 hours. He can resume his normal dose of 30 units at 8 pm Dubai time. If the patient is taking 18 units, Detemir at 8 am and 12 units at 8 pm, he will take his scheduled dose of 8 pm before travel. He should keep departure time on the watch, and in-flight morning dose will get modified as 18 X [0.9- (6/12)], which will be 7.2 units. He will take seven units at 8 am as per Sydney time and will take a scheduled dose of 18 units at 8 am in Dubai.

The pump users need to change the time of the pump to match the arrival destination.

4. To avoid confusion, one should keep the same time during the flight and be aware of both zones' timings.
5. The meal and snack related doses should be adjusted based on carbohydrate or calorie content of the meal.
6. Insulin analogs offer more flexibility and lesser hypoglycemia: the person who travels frequnetly should prefer them.
7. Prefer basal-bolus regimen to premix insulin during travel and for the next 12 to 24 hours, giving more flexibility in insulin adjustments.

Section C- Surgery

Introduction

India has nearly 95,600 cases of T1DM below 14 years of age, and 15,900 cases

are diagnosed each year in this age group[39]. A recent study found an incidence of 4.9 cases/100,000/year in India, which is much lower than the incidence of 21.2 cases/100,000/year observed in the SEARCH registry of USA[40]. Management of these individuals often differs from those with type 2 diabetes mellitus [T2DM] due to increased hypoglycemia risk during fasting. They are at risk for ketosis on withholding insulin inappropriately. Due to increased life expectancy and the prevalence of T1DM, a number of these patients may require some surgical procedures in their lifetime.

The data suggest that patients with T1DM are at increased risk of complications (infections, poor wound healing, and prolonged hospital stay) after surgery[41,42]. Hyperglycemia results in impaired leukocyte function, increased inflammatory markers and reactive oxygen molecules, promotes platelet aggregation, and limits neovascularization and collagen synthesis, resulting in poor outcomes seen in T1DM[4]. There is further evidence that suggests that good glycemic control in surgical patients is associated with improved complications[43,44]. This chapter aims to review the perioperative management of T1DM patients planned for surgery, provide practical recommendations on glycemic targets, and therapeutic strategies for achieving it.

Definitions of different periods from admission to discharge for elective surgery under general anesthesia

The peri-operative period is the period from the time of admission to the pre-operative area until discharge from the post-anesthesia care unit (PACU). This period includes pre-operative, intra-operative, and post-operative segments. The pre-operative segment includes the time since admission to the pre-operative area until the patient's transfer to the operating suite. The intra-operative segment ends with the patient transfer to PACU and the post-operative segment with discharge from the PACU. The period before and after the peri-operative period is known as the pre-perioperative and post-perioperative phase, respectively. These definitions permit developing a systematic approach to assessing the quality of care throughout the spectrum of elective surgical procedures[45].

Glycemic targets

Optimization of glycemic control before surgery helps reduce both morbidity and mortality associated with surgical procedures in patients with diabetes. HbA1c should preferably be < 8-8.5% before elective surgery[45,46]. The Joint British Diabetes Society guidelines for adult patients' peri-operative management target a glucose range between 108–180 mg/dl but with acceptable values of 72–216 mg/dl[46]. As per the American Diabetes Association (ADA), the target glucose range for the peri-operative period should be 80–180 mg/dl[47]. It is safe to keep blood glucose between 140-180 mg/dl when the patient is under sedation[46-48]. The International Society for Pediatric and Adolescent Diabetes (ISPAD) guidelines suggest a target of 90-180 mg/dl for children undergoing surgical procedures and 140-180 mg/dl in post-surgical ICU care[49].

Organization and planning of care

Pre-anesthetic assessment

Comprehensively assess the patients with diabetes well in advance, for associated co-morbidities and complications, and glycemic status. Assess the patient for ketones, electrolytes, and hydration status also. Urine ketones should be absent, and electrolytes should be normal before surgery. The ketone status should be checked whenever blood

glucose is > 250 mg/dl. Patients with autonomic neuropathy can have hypoglycemia unawareness, which can be another challenging problem in tight control. Prioritize the patients with diabetes for the operating list to avoid prolonged starvation time. Preferably, schedule patients with diabetes as the first case of the day[49] (Table VI).

Table VI: Points worth remembering in patients with Type 1 Diabetes Mellitus undergoing surgery

Parameter	Important message
Glycemic Targets	Aim for a glycemic target of 108-180 mg/dl in the perioperative period. It is safe to keep blood glucose between 140-180 mg/dl when the patient is under sedation.
Pre-anesthetic assessment and optimization	Comprehensively assess the patients with diabetes well in advance, for associated comorbidities and complications in addition to glycemic status.
Prioritization	Prioritize patients with diabetes for the operating list to avoid prolonged starvation time. Preferably, schedule the patient as the first case of the day.
Adjustment to insulin therapy during hospitalization	These patients can receive the usual insulin dose, the evening before surgery. If any, the morning dose of basal insulin analog can be reduced by 20% if the glucose readings are on the lower side on the morning of surgery. The dose of NPH should be reduced by 30-50% to prevent hypoglycemia. Stop the prandial insulin when the fasting state begins
When should an insulin infusion be started?	Start insulin infusion at least two hours before surgery. Prefer intravenous insulin for surgeries lasting more than two hours. The patients should be initiated on IV 5% dextrose/0.9% sodium chloride to reduce hypoglycemia. Use normal saline alone if blood glucose is >250 mg/dl.
The transition from intravenous insulin Infusion to subcutaneous insulin	The switch to subcutaneous insulin can be done in patients with stable infusion rate and blood glucose levels in the target range for at least 4 to 6 hours before the transition, oral intake has improved, and the patients are eating scheduled meals or are receiving stable enteral/ parenteral feeds.
Planning for Hospital Discharge	Educate the patient on self-monitoring, diet therapy, sick day guidelines, insulin injection technique, self-adjustment in insulin doses, medication instructions, and hypoglycemia management before discharge. Arrange for a follow-up visit to review glycemic control within a month, depending upon the glucose control.

Abbreviation: NPH-Neutral Protamine Hagedorn, IV-intravenous

Adjustment of insulin therapy during hospitalization, and a day before surgery

The insulin regimen and dosing in hospitalized patients with T1DM for surgery depend on several factors. This includes the type of outpatient insulin therapy, adherence to the prescribed regimen, glycemic control before admission, and nutritional status. In general, shift these patients to a basal-bolus regimen if they are on some other regimen, especially if they are not well-controlled. One should be vigilant, as the stress of surgery may result in severe hyperglycemia or ketoacidosis in patients with T1DM[50]. Frequent

blood glucose monitoring and appropriate escalation in insulin doses can help in avoiding these complications. These patients can receive the usual insulin dose, the evening before surgery.

Adjustment of insulin therapy during the day of surgery

If any, the morning dose of a basal insulin analog can be reduced by 20% if the glucose readings are on the lower side on the morning of surgery. The dose of NPH insulin should be reducedby 30-50% to prevent hypoglycemia. Stop prandial insulin when the fasting state begins[42,51]. Start insulin infusion at least two hours before surgery (Table VI). Prefer intravenous insulin infusion for surgeries lasting more than two hours[49]. The half-life of intravenous insulin is 4-6 minutes, which allows easy titration. The patients should be initiated on IV 5% dextrose/0.9% sodium chloride to reduce hypoglycemia. Use normal saline alone if blood glucose is > 250 mg/dl[46,49]. The aim for capillary blood glucose is between 108-180 mg/dl (acceptable range 72-216 mg/dl). Monitor the patient's blood glucose every 30- 60 minutes during the perioperative period, especially when the glucose levels are not in target or the patient is under sedation[46,49]. For afternoon surgeries, if breakfast is allowed, the usual dose of rapid-acting analog insulin or half the dose of short-acting regular insulin dose can be given. Give the usual patient dose of long-acting basal insulin, but if on NPH, reduce dose by 30%[49].

Transition from intravenous insulin infusion to subcutaneous insulin

The switch to subcutaneous insulin can be done in patients with a stable infusion rate and blood glucose (BG) levels in the target range for atleast 4 to 6 hours before the transition. Additional requirements for this transition include, improvement in oral intake, and the patients are eating scheduled meals or are receiving stable enteral/parenteral feeds[47].

When the regular insulin provides prandial coverage, total daily dosage (TDD) is divided equally into four portions, one for basal insulin injection and three prandial insulin injections. The TDD is 60-80% of the total dose requirement while on insulin infusion. On the other hand, while using insulin analog for prandial coverage, use 50% of TDD as basal insulin, and divide the rest 50% into three equal portions for each prandial injection. The intravenous infusion should never be discontinued abruptly because of the short half-life of intravenous insulin and a delay associated with subcutaneous insulin onset. The first dose of subcutaneous short or rapid-acting insulin should be administered 1-2 hours before the eventual discontinuation of intravenous infusion[52]. The insulin dose may be higher in the initial 24-48 hours due to surgical stress. The dose may also vary due to changing nutritional status and concomitant medications.

Planning for Hospital Discharge

Tailor the discharge plan as per the patient's recovery status, glycemic status at discharge time, and arrange follow-up visits with the diabetologist /endocrinologist within 1-4 weeks. The visit can be earlier if the glucose control is not good, else it can be at the end of one month[47]. The patient should also be educated on self-monitoring, diet therapy, sick day guidelines, insulin injection technique, self-adjustment in insulin doses, medication instructions, and hypoglycemia management. Try to ensure an adequate medical supply with the social workers' help for patients with financial constraints[51].

Organization and planning of care for surgeries on a daycare basis (Minor surgeries)

In general, minor surgery is a procedure that lasts less than 2 hours, and the patient will be able to eat within 2-4 hours[49]. Give basal insulin as usual. Give a subcutaneous rapid-acting analog for BG ≥ 180 mg/dl. Give a usual prandial dose of rapid-acting insulin, or 50% of regular insulin before surgery in those allowed to take a usual meal. After surgery, if the patient has resumed a regular diet, the patient's home schedule of insulin is initiated[51]. Due to the faster onset of action (between 5–15 min) and a rapid peak in 1–1.5 hours, prefer rapid-acting insulin analogs in daycare surgeries.

Organization and planning of care for emergency surgeries

Check the blood glucose (BG), blood beta-hydroxybutyrate (if available) or urinary ketone concentration, and serum electrolytes before surgery. Check the blood gases if ketone or BG levels are high. Delay the surgery till correction is done for diabetic ketoacidosis, circulating volume, and electrolyte deficits[49,53].

Insulin management during Enteral/Parenteral Feedings in T1DM

Intravenous insulin is the preferred approach for patients with T1DM receiving enteral or parenteral feedings[50]. The alternative approach uses a subcutaneous basal-bolus insulin regimen for those receiving intermittent feeds similar to major meals and minor snacks. Calculate the initial doses on the concepts mentioned previously for a transition from intravenous insulin to subcutaneous insulin, with long/intermediate-acting insulin comprising 50% of total daily dose (TDD) if given with rapid-acting analogs and 25% of the TDD if given along regular insulin. Give correctional doses as per the level of glucose and the urgency of correction[47,52,54]. Do the preliminary dose escalation using the assumption that 1 unit of regular human insulin or rapid-acting insulin given subcutaneously before each meal will be required per 10–15 g carbohydrate[47].

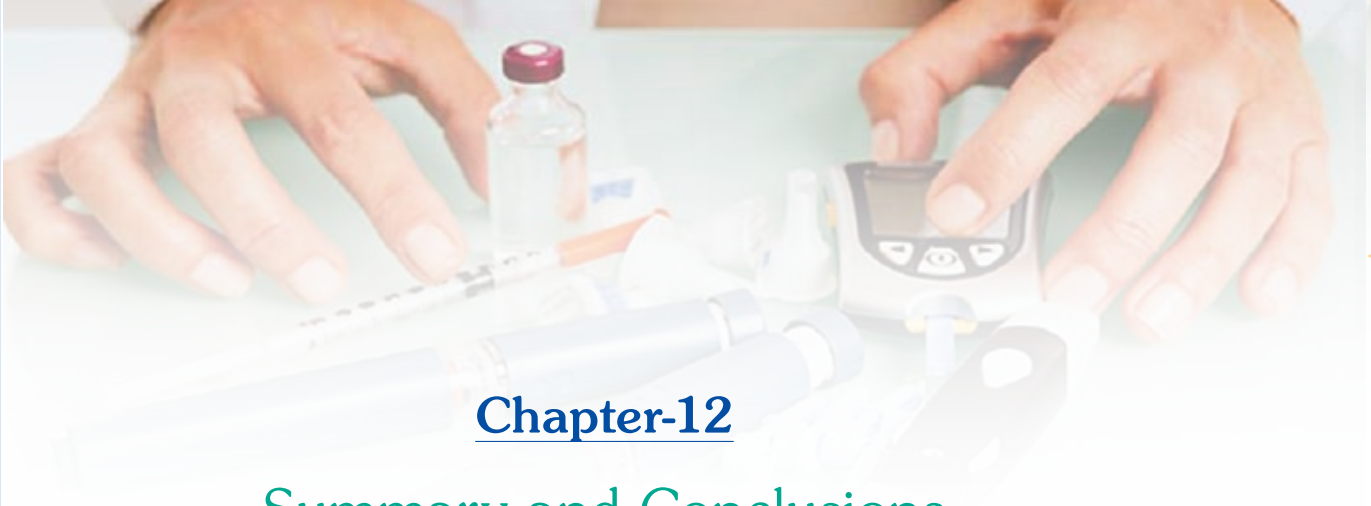
Hypoglycemia

Avoid hypoglycemia (defined BG ≤ 70 mg/dl) in the hospital setting. However, when hypoglycemia occurs, review the patient's overall treatment regimen to avoid future hypoglycemic episodes. Hypoglycemia triggers may include reduced dietary intake or unexpected interruption of oral or other nutrition modes, inappropriate timing/dose of insulin with meals[47].

In the perioperative period, if patient's BG is < 80 mg/dl, start a dextrose-containing intravenous solution (dextrose 5% or 10%) at 100–150 ml/h or 50–75 ml/h, respectively. If patient BG is < 70 mg/dl, administer 25 ml dextrose 50% solution IV and start IV dextrose 5% in water[48,49]. Increase BG monitoring to every 15 min until BG levels are above 100 mg/dl on two consecutive measurements. In patients who are alert and can eat/drink, treat hypoglycemia with 15–30 g carbohydrate administration (glucose)[47-50].

Summary

Prefer surgery in T1DM at centers with appropriate expertise and facilities to care for these individuals. Management of these individuals often differs from those with T2DM, due to increased risk of hypoglycemia during fasting and high risk for ketosis due to



Chapter-12

Summary and Conclusions

Dr. V. Mohan and Dr Nikhil Tandon

The burden due to diabetes in the young is increasing rapidly. In India, diabetes in the young presents a fascinating array of different types of diabetes of which type 1 diabetes would be the commonest in children and adolescents. One should, however, also keep in mind that type 2 diabetes is also now becoming more common in children. Moreover, type 1 diabetes can occasionally be wrongly diagnosed in a patient with Maturity Onset Diabetes of the Young (MODY) or Fibro Calculous Pancreatic Diabetes (FCPD) or other forms of diabetes which present at a younger age.

Today, more and more children are being diagnosed with type 1 diabetes in our country. This may be because the actual prevalence of the disorder is going up in India. It may also reflect better awareness and therefore, improved diagnosis of type 1 diabetes. Finally, it could be that children are surviving more due to early diagnosis and better treatment.

Management options for children with type 1 diabetes have greatly improved in the last 3 – 4 decades. In the 1960s and 70s, urine glucose monitoring was the norm and glucometers had not arrived. Even when they did, they were expensive, painful, extremely cumbersome and mostly inaccurate. Today, we have blood glucose monitors which are extremely precise, and are less painful. Cost of strips however, still remains a challenge.

With the arrival of Continuous Glucose Monitoring (CGM), a paradigm shift in the monitoring and control of type 1 diabetes has occurred all over the world although again, cost considerations remain an issue in India. Thanks to better management, diabetic ketoacidosis is becoming less common, although in rural areas, and in peripheral centres, it still remains a big problem. Going forward, all efforts must be made to prevent or further reduce the incidence of diabetic ketoacidosis.

This document is a compilation of different chapters on type 1 diabetes dealing right from the epidemiology and diagnosis and differential diagnosis of type 1 diabetes to lifestyle, diet and exercise, insulin, monitoring, acute complications, microvascular complications including retinopathy, diabetic kidney disease and nerve diseases, macro vascular complications, education, problem of T1D in special groups like pregnancy, travel and driving. Thus, it covers practically the whole gamut of type 1 diabetes. It also incorporates most of the published Indian references on the subject.

A galaxy of authors and expert reviewers have contributed to make these guidelines a valuable addition to any library. Moreover, it will be useful for students, physicians, diabetologists and endocrinologists and practically to anyone else who would be interested in learning more about type 1 diabetes. It is hoped that these guidelines would ultimately translate into improved care of the child, adolescent or young adult with type 1 diabetes, thereby helping them to live a long and healthy life despite their disorder.

There are still formidable challenges in providing equitable treatment to everyone with type 1 diabetes in the world and India is no exception to this. It is hoped that with improved diabetes control, the dreaded complications of diabetes like blindness, kidney failure, amputations, heart attacks and stroke, not to mention diabetic ketoacidosis, impotence and painful neuropathy can all be reduced, if not totally eliminated.

Appendix

Table I: 15 g carbohydrate exchanges for the common Indian foods

Breads and cereals	Starchy vegetables	Snack foods	Fruits and juices	Biscuits and Sweets
Bread (white, wheat): 1 slice	Aloo Gobi: 1 cup	Papad: 2	Apple/Banana/ Orange/pear/ pomegranate: 1 small	Parle G/Good day / nutrichoice/ oreo/ cream crackers/oat meal cookies/digestive high fiber: 3
Roti (Bajra, Makai, Jowar, Multi-grain), paratha plain/ thepla/aloo paratha: ¾ (6")	Mashed potato/sweet potatoes/ yams: ½ cup	6 Panipuri/4 Dahipuri Sevpuri: 2 ½	Black-blueberries/ pineapple: ¾ cup	
	Baked Beans/Cassava: ⅓ cup	Bhelpuri: ½ cup		Good day (butter)/Dark fantasy/Bourbon: 2
Chapati: 1 (6")	Potato, Boiled or Baked: 1 small	Vegetable Cutlet: 1 medium	Cherries: 12	
Kulcha/Tandoori roti/ Paneer Paratha: ½	Green peas: ½ cup	Handavo/ Kachori: 1 (3/4" square)	Melon: 1 slice (300g)	Marie gold/Hide and seek: 4 Monaco biscuits/ vanilla wafers: 5
			Plums: 2 small	
Naan: ¼ (8" * 2")	Plantain: 1/3 cup	Veg Samosa: ¾ (1 samosa= 2 ½ carbohydrates)	Watermelon: 1¼ cup	50-50 Maska Chaska: 7
Puris: 2 (5" d)	Corn on the Cob: 1 (6")	Bread pakora: 2/3	Papaya: 1 cup	Britannia 5 grain: 1
Cornbread: 1 (3" * 4")	Sweet corn: ½ cup	Pakoda, Spinach: 3 pcs.	Apricots: 4 medium (fresh)	Animal Crackers: 8
Croissant/pav: 1 small	Pumpkin: 1 cup	Potato chips: 9-13 (¾ oz)	Fresh Figs: 2 medium	Rusk: 2
1 Dosa of approx. 10" diameter uttapam: ½ small vegetable or 1 smallutta-pam, 4"	Vegetable Korma: ½ cup	Banana chips: 20	Grapefruit: ½	Gulab Jamun/besan-laddoo/rasmalai/pudding: 1 small
Rice/ravaidli: 1 small rice idli or 2 smallravaidli		French Fries: 12	Seetaphal/ Chikoo/peach: 1 medium	
Vada: 1 ½	Pulses/Dals/ Beans	Namkeen: ½ cup		Honey/Jam/sugar/ jaggery: 1tbsp

Breads and cereals	Starchy vegetables	Snack foods	Fruits and juices	Biscuits and Sweets
Pancake: 1 (4" * ¼")	Cooked Bengal gram/ Black eyed peas/Black gram/Green gram/ horse gram/red gram/Rajma/ peas/ split peas/ moth beans: ½ cup	Dhokla: 2	Grapes: 17 small	Kulfi/Ice cream/seviyan kheer: ½ cup
Chocos/cornflakes: ½ cup		Khandvi:12 medium	Guava: 1 large	
Cooked noodles: ½ cup		Momos: 2	Jackfruit/mango pieces: ½ cup	Puranpoli: 1/2
English Muffin/ Hot Dog bun: ½		Granola or Snack Bar: 1	Jambu/Jamun: 6	Rasgulla: 1 medium
Muffin: 1 small	Cooked lentils, Brown/ Green/Yellow: ½ cup	Dates (fresh): 6, Dry dates: 3	Kiwi: 1 small	Sooji Halwa: ¼ cup
Muesli/oats: 1/3 cup		Raisins: 35	Papaya cubes/ Raspberries: 1 cup	Cupcake edge shaved off: 1
Cooked White rice/Brown rice/Quinoa/ Bajra/Barley/ Bisibele bath/ / upma: ⅓ cup	Lima Beans: ⅔ cup	Groundnuts: 30	Passion Fruit: ½ medium	Cake: 1 (2" square)
	Rasam/thin mixed dal: 1 cup	Cashewnuts: 45	Pineapple: 3 slices (1/2 cup)	Cookie: 2 small
	Sambar: ½ cup	Walnuts: 65	Strawberries: 7 medium	Carrot Halwa: 1/3 cup
Cooked Poha/ Pasta/Ragi/ jowar/ dalia/ sprouted wheat/ oat meal/ sabudanakichdi/ kichdi/ Matkiusal: ½ cup	Roasted chana: ½ cup	Pistachios: 88	Cubed watermelon: 1¼ cup	Donut: 1 medium
	Sprouted moong:1cup	Almonds: 110	Apple/orange/ pineapple/guava / grape fruit Juice: ½ cup	Brownie/Rasmalai: 1 small
	Khadi: 2/3 cup			
		Nonvegetarian foods	Grape/ mango/ prune juice: ⅓ cup	Milk and Milk products
Pizza: 1 slice (6")	Nonstarchy vegetables	Chicken wrap: ½	Soft Drink/ Soda: ¾ cup	Low-fat or fat-free milk/plain yogurt/ Masala chai with 1% milk: 1 cup
Veg wrap: 1/2	Cooked Vegetables: 1½ cup	Dhansak/Haleem: ½ up	Energy Drink/fruit drink/lemonade: ½ cup	
25 g/3 tbsp atta (whole wheat)	Raw Vegetables: 3 cups	Mutton biryani/chicken biryani/egg biryani: ½ cup		
25 g/ 3 tbsp maida	Vegetable Juice: 1½ cup			