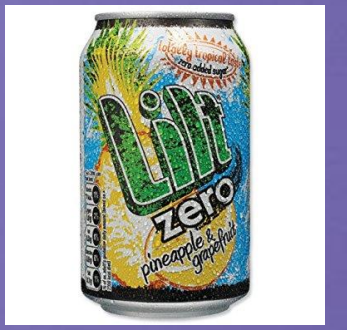




Helping people with diabetes make healthier choices during Ramadan Part Three











Pre-Ramadan assessment

- Preparation is paramount
  - Consultation before Ramadan early as possible (at least 1–2 months prior)
  - Or at next consultation
- Risk assessment of fasting
- Imperative to ensure patient feels supported in their choice to fast, their choice is respected and managed accordingly
  - There will be individuals who fast despite medical advice.

Risk stratification

High Risk - Advised not to fast

- Type 1 diabetes
- Poor glycaemic control, defined as HbA1c > 69mmol/mol (> 8.5%)
- Hypoglycaemic unawareness
- Severe episodes of hypoglycaemia (loss of consciousness or requiring third party assistance) in three months prior to Ramadan
- Recurrent episodes of hypoglycaemia in three months prior to Ramadan
- History of diabetic ketoacidosis in the three months prior to Ramadan
- History of hyperosmolar hyperglycaemic coma in the three months prior to Ramadan
- Comorbidities: advanced macrovascular complications, renal disease, liver disease, cognitive dysfunction, uncontrolled epilepsy
- Acute illness, including a diabetic foot infection or foot ulcer
- Pregnant women
- Frequent intense physical labour

Moderate Risk – May fast if patient and health-care professionals are happy, with collaboration of care between all involved

- Moderate glycaemic control, defined as HbA1c 58 to 69mmol/mol (7.5 to 8.5%) and no major complications of diabetes
- Well-controlled diabetes, defined as HbA1c <58mmol/mol (< 7.5%) treated with sulphonylurea, short-acting insulin secretogogue, insulin, or treated with a combination oral or oral and insulin treatment

Low Risk - Should be able to fast with advice

- Diet-controlled diabetes
- Diabetes well-controlled with monotherapy (Metformin, DPP-4 inhibitors, Acarbose, GLP-1 agonists, SGLT2 inhibitors or thiazolidinediones) and otherwise healthy

Ali S et al. Guidelines for managing diabetes in Ramadan. Diabetic Medicine 2016

Topics to cover

- Full annual review
- Investigations: Bloods (HbA1c, lipid profile, renal function) and urinary albumin to creatinine ratio.
- Risk stratification: assess suitability to fast
- Risks of fasting
  - including when to stop fasting
- Medication review and alteration of medications for safe fasting
- Blood glucose monitoring
- Dietary advice
- Exercise
  - Regular light and moderate exercise generally safe
  - Rigorous exercise not recommended
- Smoking cessation

Blood glucose monitoring

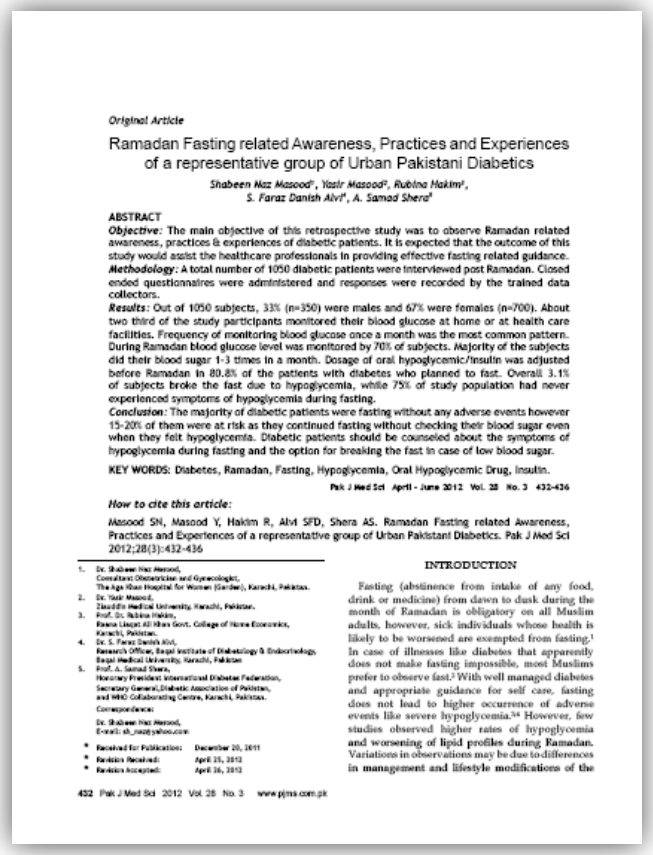
- Does not break the fast
- Monitor BMs at beginning of the fast
- Monitor BMs regularly every 4 hrs
- Check BMs:
  - if any symptoms of hypoglycaemia
  - or if the patient becomes unwell
- Stop fasting if:
  - Hypoglycaemia BM < 3.9 mmol/l at any time during fast
  - BMs 3.9 mmol/l at the start of fast & on insulin/ SUs
  - Hyperglycaemia BMs > 16.7 mmol/l

Meals in Ramadan

- Abstain from eating and drinking during the daylight hours: dawn to sunset
- Two meals per day:
  - Suhoor (preceding dawn)
  - Iftar (sunset)

Ramadan fasting-related awareness, practices and experiences in urban Pakistani diabetics

- Retrospective survey of 1050 subjects
- 79% of subjects had school or college education



Original Article

Ramadan Fasting related Awareness, Practices and Experiences of a representative group of Urban Pakistani Diabetics

Shabeen Naz Masood[1], Yasir Masood[2], Rubina Hakim[3], S. Faraz Danish Alvi[4], A. Samad Shera[5]

ABSTRACT

Objective: The main objective of this retrospective study was to observe Ramadan related awareness, practices & experiences of diabetic patients. It is expected that the outcome of this study would assist the healthcare professionals in providing effective fasting related guidance.

Methodology: A total number of 1050 diabetic patients were interviewed post Ramadan. Closed ended questionnaires were administered and responses were recorded by the trained data collectors.

Results: Out of 1050 subjects, 33% (n=350) were males and 67% were females (n=700). About two third of the study participants monitored their blood glucose at home or at health care facilities. Frequency of monitoring blood glucose once a month was the most common pattern. During Ramadan blood glucose level was monitored by 70% of subjects. Majority of the subjects did their blood sugar 1-3 times in a month. Dosage of oral hypoglycemic/insulin was adjusted before Ramadan in 80.8% of the patients with diabetes who planned to fast. Overall 3.1% of subjects broke the fast due to hypoglycemia, while 75% of study population had never experienced symptoms of hypoglycemia during fasting.

Conclusion: The majority of diabetic patients were fasting without any adverse events however 15-20% of them were at risk as they continued fasting without checking their blood sugar even when they felt hypoglycemia. Diabetic patients should be counseled about the symptoms of hypoglycemia during fasting and the option for breaking the fast in case of low blood sugar.

KEY WORDS: Diabetes, Ramadan, Fasting, Hypoglycemia, Oral Hypoglycemic Drug, Insulin.

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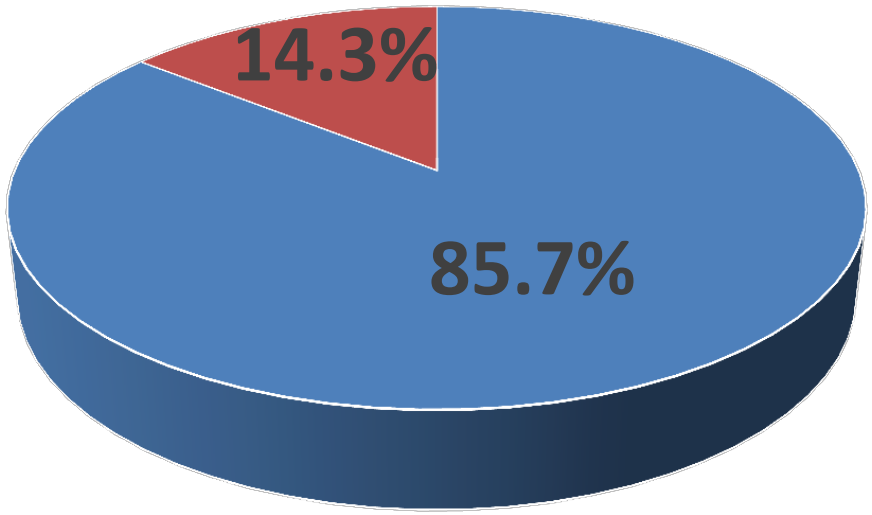
INTRODUCTION

Fasting (abstinence from intake of any food, drink or medicine) from dawn to dusk during the month of Ramadan is obligatory on all Muslim adults, however, sick individuals whose health is likely to be worsened are exempted from fasting.[1] In case of illnesses like diabetes that apparently does not make fasting impossible, most Muslims prefer to observe fast.[2] With well managed diabetes and appropriate guidance for self care, fasting does not lead to higher occurrence of adverse events like severe hypoglycemia.[3,4] However, few studies observed higher rates of hypoglycemia and worsening of lipid profiles during Ramadan. Variations in observations may be due to differences in management and lifestyle modifications of the

Masood SB, et al. Pak J Med Sci 2012;28(3):432-436

Breaking the fast when hypoglycaemic



- Felt hypoglycaemia but continued fasting
- Felt hypoglycaemia and broke the fast

In a real-world study in Pakistan, less than 15% of those who experienced symptoms of hypoglycaemia during Ramadan broke their fast

Masood SB et al. Pak J Med Sci 2012;28(3):432-436

Ramadan fasting-related awareness, practices and experiences in urban Pakistani diabetics

Ramadan fasting-related experiences

Weight change after Ramadan	Male	Female	Total
Not answered	4.3%	2.7%	3.2%
Weight loss	12.8%	18.5%	16.6%
Weight gain	35.6%	38.1%	37.2%
No change	47.3%	40.8%	43.0%

Masood SB, et al. Pak J Med Sci 2012;28(3):432-436

CREED Study
Food intake in Ramadan

Average number of meals consumed each day during Ramadan		
1	54	(1.7)
2	2076	(64.1)
3	1030	(31.8)
4 or more	79	(2.4)
Change in size of meals	1657	(51.7)
Eat smaller meals	662	(40.5)
Eat larger meals	972	(59.5)
Predominant change in the type of meals		
Eat more carbohydrate	1084	(61.8)
Eat more protein	1032	(58.9)
Eat more fat	690	(39.4)

Babineaux SM et al. Diabet Med 2015. doi: 10.1111/dme.12685. [Epub ahead of print]

Ramadan fasting-related awareness, practices and experiences in urban Pakistani diabetics

Ramadan fasting-related experiences

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Managing patients with Type 1 diabetes

- Patients with Type 1 diabetes should be **discouraged** from fasting
- Carbohydrate counting is of great assistance
- Safest regime:
  - basal–bolus regime (preferably with insulin analogues)
  - insulin pump
  - frequent BM monitoring

Basal long-acting insulin

- Reduce by 20% and taken with evening meal (Iftar)
- Omit mid-day rapid-acting insulin whilst fasting

Insulin pumps

- basal infusion rates programmed and individualized
- boluses of insulin at meal times/ if hyperglycaemia occurs
- Not widely available, costly
- Time and good preparation are required for patients to adjust pump therapy

Managing patients with Type 2 diabetes

Diet-controlled diabetes

- Risks of fasting low
- Possibility of postprandial hyperglycaemia occurring with indulgent eating
- Eat sensibly and increase physical activity

Metformin

- Hypothetical risk of severe hypoglycaemia is low
- Total dose of metformin over 24 hrs can stay the same.
- Lunchtime dose can be taken at Iftar

Acarbose

- No data in Ramadan
- Acarbose has a low independent risk of hypoglycaemia
- Dose does not need to be changed provided taken with meals during Ramadan

Short-acting insulin secretagogues (meglitinides) - repaglinide and nateglinide

- Associated with hypoglycaemia
- Studies suggest safe in Ramadan
- Taken with the two meals of Ramadan, but used with caution

Managing patients with Type 2 diabetes

Sulfonylureas

- Increasing insulin release from pancreatic beta-cells
- Should be used with caution in Ramadan
- Particularly longer-acting sulfonylureas, such as glibenclamide and gliclazide MR

- Once-daily sulfonylureas:
  - switch the timing to take with the evening Iftar
- Patients with history of hypoglycaemia on sulfonylureas, consider switching to dipeptidyl peptidase-4 (DPP– 4) inhibitors
- Shorter-acting sulfonylureas:
  - Reduce morning dose with Suhoor
  - Larger dose taken with Iftar

Managing patients with Type 2 diabetes

Thiazolidinediones

- In Ramadan, most likely safe
- Not associated with hypoglycaemia
  - May augment hypoglycaemia caused by other medications used in combination
- Increase in appetite
- Glucose-lowering benefits take 2–4 weeks: not alternative as immediate pre-Ramadan switch

Managing patients with Type 2 diabetes

DPP–4 inhibitors

- Not independently associated with an increased risk of hypoglycaemia
- Vildagliptin most studied in Ramadan: (VECTOR/ VIRTUE/ STEADFAST)
  - Reduced HbA1c levels
  - Fewer hypoglycaemic events contrast to SUs
  - Better treatment adherence
  - Potentially less weight gain
- Those patients on dual therapy of DPP–4 inhibitors and SUs, with suboptimal control [HbA1c > 58 mmol/mol (> 7.5%)], stopping SUs challenging

Managing patients with Type 2 diabetes

SGLT2 inhibitors

- Risk of hypoglycaemia low
- Weight loss due to net calorie loss
- Risk of dehydration and postural hypotension
- No available clinical evidence for their use and safety during Ramadan
- Recommendation:
  - Use with caution
  - Drink at least 2 L of water/ day to reduce the risk of dehydration
  - Initiation on an SGLT2 inhibitor prior to Ramadan should be avoided

Diabetic ketoacidosis and SGLT2 inhibitors

- May 2015, U.S. FDA: warning of increased risk of DKA with atypical mild-to-moderate glucose elevations (euglycaemic diabetic ketoacidosis)
- In Ramadan fasting, test for ketones periodically throughout the fasting period
- Pay close attention for any signs of ketoacidosis:
  - difficulty breathing, nausea, vomiting, abdominal pain, confusion, and unusual fatigue or sleepiness

Managing patients with Type 2 diabetes

Glucagon-like peptide 1 receptor agonists

- Considered relatively safe during Ramadan
- Act in a glucose-dependent manner: low hypoglycaemic profile
- Few studies in Ramadan
- LIRA-Ramadan study: RCT in two UK centres (n = 99) compared SUs with liraglutide in combination with metformin
- Weight loss, improved HbA1c and fewer hypoglycaemic events

Managing patients with Type 2 diabetes

Insulin

- Insulin doses should be adjusted and individualized during Ramadan
- Patients well controlled on twice-daily mixed insulin:
  - Morning dose should be taken instead with Iftar (at dusk)
  - Evening dose halved and taken with Suhoor (at dawn)
- Basal-bolus regimes:
  - Short-acting insulins with two meals of Ramadan
  - Basal insulin administered with larger evening Iftar meal
  - Reduce basal insulin dose by 20%

Table 4 Recommendations for medical therapy changes during Ramadan (adapted from Karamat *et al*. [9])

Treatment prior to Ramadan	During Ramadan
Diet-controlled diabetes	Dietary advice and increase physical activity
Metformin	No change in total 24-h dose is required.
Standard preparation	
e.g. Metformin 1000 mg bd	No change is required.
e.g. Metformin 500 mg tds	If a lunch-time dose is usually taken, then this should be taken at sunset (Iftar) together with the evening dose, e.g. metformin 500 mg tds prior to Ramadan should be converted to 500 mg at predawn meal (Suhoor) and 1000 mg at sunset (Iftar).
Prolonged release preparation	
e.g. Metformin SR 1000 mg od	If patients are on metformin SR 1000 mg od, this dose should be taken at Iftar.
Thiazolidinediones	No change required to dose. Caution should be to other oral hypoglycaemics taken in combination, e.g. sulfonylurea dose will need to be adjusted.
e.g. Pioglitazone 30 mg od	
Sulfonylureas	Consider reducing dose of sulfonylurea for $HbA_{1c} \leq 58$ mmol/mol (≤ 7.5%) or if have a history of hypoglycaemic episodes.
Short-acting sulfonylurea	
e.g. Gliclazide 80 mg bd	Morning dose should be halved and taken with Suhoor and evening dose can stay the same, e.g. gliclazide 80 mg at Iftar, 40 mg at Suhoor.
e.g. Gliclazide 80 mg a.m. + 40 mg p.m.	Doses should be reversed so the larger dose is taken with Iftar in the evening, e.g. gliclazide 80 mg at Iftar, 40 mg at Suhoor.
Long-acting sulfonylurea	Switch to repaglinide or short-acting sulfonylurea, if possible, otherwise dose should be taken with evening meal, Iftar, e.g. glimepiride 4 mg at Iftar.
e.g. Glimepiride 4 mg od	
Other insulin secretagogues	No change is required to dose of repaglinide and should be taken with meals.
e.g. Repaglinide 4 mg bd	
DPP-4 inhibitors	No change is required. If taken in combination with sulfonylurea, the sulfonylurea dose must be reduced and timings changed (as above)
e.g. vildagliptin 50 mg bd, sitagliptin 100 mg od, saxagliptin 5 mg od and linagliptin 5 mg od	
Sodium–glucose co-transporter 2 inhibitors	Patients should be well-established on these drugs. No change in dose is required but caution around dehydration and syncope in warm countries, as well as patients pay close attention for any signs of ketoacidosis and be provided with ketone testing kits.
e.g. dapagliflozin, canagliflozin	
Glucagon-like peptide 1 agonists	No change to doses is required. However, if there is severe nausea, reduce dose of glucagon-like peptide 1 agonist by 50%. If taken in combination with sulfonylurea, sulfonylurea dose should be reduced and timings adjusted (as above).
e.g. liraglutide 1.2 mg od, exenatide 10 μg bd, lixisenatide 20 mg od, exenatide qw.	With exenatide ensure that the duration between both the doses is > 6 h. This may be affected when duration of fast is > 18 h.
Insulin	
Long-acting (basal) insulin	Long-acting insulin dose to be reduced by 20% and taken at Iftar, e.g. glargine dose to reduce from 20 units to 16 units and take with evening Iftar meal.
e.g. Glargine 20 units od	
Rapid-acting (meal-time) insulin	Omit lunch dose and take twice daily with meals at Suhoor and Iftar
e.g. Novorapid/Humalog 10 units tds with meals	e.g. Novorapid/ Humalog 10 units with Suhoor and Iftar.
Mixed insulin	Consider changing to basal bolus regime. Otherwise reverse doses so morning dose taken at Iftar and evening dose taken at Suhoor. Halve Suhoor dose.
e.g. Novomix 30 – 30 units a.m. and 20 units p.m.	e.g. Novomix 30 – 10 units at Suhoor and 30 units at Iftar.
e.g. Humalog Mix 25 – 20 units a.m. and 20 units p.m.	e.g. Humalog Mix 25 – 10 units a.m. and 20 units p.m.
e.g. Humulin M3 – 32 units a.m. and 24 units p.m.	e.g. Humulin M3 – 12 units a.m. and 32 units p.m.

od, once daily; bd, twice daily; tds, three times daily.

Special circumstances

Pregnancy

- Pregnant women with diabetes are exempt from fasting
- Maternal and foetal risks associated with poor glycaemic control in pregnancy

Smoking

- Muslims must abstain from smoking during fasting hours
- Opportune time for smoking cessation
- Study of smoking cessation in British Pakistani and Bangladeshi adults: Ramadan had a positive impact on willingness to quit smoking

Taraweeh prayers

- Nightly special prayers held in Ramadan
- Repeated cycle of rising, kneeling and bowing
- Often people will walk to the mosque
- Accounted for in exercise regime
- Carry water and treatment for hypoglycaemic events

Case study 1: patient characteristics

Patient:

Ahmed, aged 46 years
He is an accountant and plays football once a week as the only source of exercise.
He has had type 2 diabetes for 3 years
HbA1c: 57 mmol/mol (7.4%)
BMI: 29 kg/m^2
Current treatment: Metformin 1,500 mg daily
Complications: None

Additional Notes:

Ahmed lives with his wife and 3 children. He usually plays football with his friends every Saturday afternoon. He's looking forward to fasting during Ramadan and enjoying the festivities of the month as he often meets family and friends for Iftar or Suhur during Ramadan. In additional, he smokes Shisha with his friends and family Friday to Sunday, and during the week smokes 5 cigarettes a day. He knows he shouldn't smoke as his father had a heart attack, but his work is stressful at the moment.

Case study 2: patient characteristics

Patient:

Fatima, aged 37 years
She is a physical education teacher.
She has had type 2 diabetes for 3 years (developed during 2nd pregnancy)
HbA1c: 61 mmol/mol (7.7%)
BMI: 27.5 kg/m^2
Current treatment: Metformin 1500 mg/daily, glimepiride 2mg OD (added 3 months ago when HbA1c was 8.1%)
Complications: None
Non-smoker

Additional Notes:

Since adding glimepiride, Mrs Fatima's weight increased by 1.5 kg. She attends your clinic 3 months before Ramadan and her latest HbA_{1c} is 61 mmol/mol (7.7%). She experienced symptoms of hypoglycaemia twice during busy days at work. She usually doesn't do many home CBG measurements and she heard from a friend that it should not be done in Ramadan. She is also thinking about a pregnancy and is not using contraception.

Case study 3: patient characteristics

Patient:

Youssef, aged 58 years
He is a minicab driver and works long hours plays football once a week as the only source of exercise.
He has had type 2 diabetes for 5 years
HbA1c: 65 mmol/mol (8.1 %)
BMI: 36 kg/m^2
Current treatment: Metformin 1,000 mg bd, Sitagliptin 100 mg od, Glargine 6 units
Retinal screening: Background retinopathy
Non-smoker

Additional Notes:

Youssef lives with his wife and 5 children. He works long hours most days and comes home tired, so doesn't routine exercise. He is looking forward to fasting and doing the extra prayers in Ramadan. He also looks forward to the special meals his wife makes to help him get through the long fasts and his work day. He particularly enjoys the extra prayers (Taraweeh) at the Mosque, as he can walk there and he can share desserts with his friends. He only checks his BMs when he is to drive but doesn't bother at other times.

Case study 4: patient characteristics

Patient:

Ayesha, aged 65 years
She is a housewife.
She has had type 2 diabetes for 11 years
HbA1c: 73 mmol/mol (8.8%)
BMI: 36.5 kg/m^2
Current treatment: Metformin 2000 mg/daily, Pioglitazone 30 mg od, Gliclazide 160 mg bd
Retinal screening: Previous pre-proliferative retinopathy
Complains of burning pain and pins and needles in feet

Additional Notes:

Ayesha makes the meals for the family and enjoys Ramadan as she can spend time making new meals for the extended family, who visit regularly to break the fast together. Since adding Gliclazide and Pioglitazone 3 years ago, Ayesha's weight has increased by 3.5 kg. She attends your clinic 3 months before Ramadan and her latest HbA_{1c} is 73 mmol/mol (8.8%). She experienced symptoms of hypoglycaemia a few times in Ramadan last year, so stopped taking Gliclazide in Ramadan. She usually doesn't do many home CBG measurements and has heard from a friend that it should not be done in Ramadan.

Case study 5: patient characteristics

Patient:

KK, aged 43 years
He is a Taxi driver (resigned as financial advisor due to stress).
He has had type 2 diabetes for 4 years
HbA1c: 68 mmol/mol (8.4%)
Cholesterol: 6.1mmol/L
Creatinine: 68umol/L
BMI: 32.5 kg/m^2
Current treatment: Metformin 1500 mg/daily.
Retinal screening: Previous pre-proliferative retinopathy

Additional Notes:

KK was diagnosed as Type 2 Diabetes Mellitus 4 years

Father , Mother and **b**rothers (two) both suffer from Type 2 Diabetes.

He does not do any exercise and is of Pakistani origin.

Ramadan: Further reading

- Ali S et al. Guidelines for managing diabetes in Ramadan. Diabet Med. 2016 Oct;33(10):1315-29.

- Hassanein M et al; International Diabetes Federation (IDF), in collaboration with the Diabetes and Ramadan (DAR) International Alliance. Diabetes and Ramadan: Practical guidelines. Diabetes Res Clin Pract. 2017 Apr;126:303-316.

Ramadan: further reading for patients

- https://www.diabetes.org.uk/guide-to-diabetes/managing-your-diabetes/ramadan/
- http://www.mcb.org.uk/be-careful-with-your-health-this-ramadan/

MCB

The Muslim Council of Britain

Ramadan and Diabetes:

A guide for people with diabetes

This leaflet has been created to help answer common questions regarding your diabetes and how it may be affected in Ramadan

Before you choose to fast, please read the advice below and consult your GP, diabetes doctor or diabetes nurse

MANAGING DIABETES DURING RAMADAN

RAMADAN AND DIABETES

If you are planning on fasting and have diabetes, it is important to speak to your diabetes healthcare team as early as possible before Ramadan. For some people with diabetes, fasting can be dangerous or can cause problems to your health. Your diabetes team will be able to advise you on whether it is safe for you to fast. If you are able to fast, they will advise you on how to keep good diabetes control throughout the fasting period.

From 2015, for the next several years Ramadan in the UK is in the summer months and the length of fasts is very long (17 hours +). Long fasts put you at higher risk of hypoglycaemia and dehydration, which can make you ill.

High blood glucose levels can also occur if you eat excessively at *Suhoor* or *Iftar*.

WHAT IS DIABETES?

- Diabetes is a health condition where the amount of glucose in your blood gets too high.
- This happens if your pancreas doesn't make any insulin or enough insulin to help the glucose enter your body's cells. Or the insulin it does make doesn't work properly.
- Insulin is the hormone produced by the pancreas that allows glucose to enter the body's cells.

THERE ARE TWO TYPES OF DIABETES

Type 1 is when the body is unable to produce any insulin, which we need to break down the glucose (energy) in what we eat or drink.

- We don't know exactly what causes it, but we know it's not to do with being overweight. You can't prevent Type 1 diabetes.
- It is usually diagnosed when you are a child or young adult, although can occur in older adults as well.
- Approximately 10 per cent of people with diabetes have Type 1.

Type 2 develops when the body cannot make enough insulin, or when the insulin produced doesn't work properly.