

Webinar will begin at 10 am Pacific/ 1 pm Eastern (US/Canada)

Please Standby





Diabetes and Ramadan: A Challenge and an Opportunity?

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Pew Research Center's Forum on Religion & Public Life • Mapping the Global Muslim Population, October 2009



Exemptions from Fasting

- The Quran (The Holy Quran, Al-Bakarah, 183-185) and the teachings of the Prophet Mohammed (SAAWS) clearly exempts <u>SOME</u> from fasting including:
 - Children
 - Any ill person
 - Pregnant women
 - Women who are breast-feeding or during their menses
 - Any person traveling
 - People with reduced mental capacity



- <u>SOME</u> patients with diabetes fall under this category because their chronic metabolic disorder may place them at high risk for various complications if the pattern and amount of their meal and fluid intake is markedly altered.
- This exemption represents more than a simple permission not to fast; The Prophet Mohammad (SAAWS) said: "God likes his permission to be fulfilled, as he likes his will to be executed."
- Nevertheless, many patients with high risk medical conditions insist on fasting during Ramadan, despite medical advise





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Prevalence of fasting in Muslims with DM: EPIDIAR Study

12,243 people with diabetes



Salti et al. Diabetes Care, October 2004

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Type 1 DM-The variability across many countries

42.8% fasted for ≥15 days



EPIDIAR: Epidemiology of Diabetes and Ramadan 1422/2001

1. Salti I et al (2004) *Diabetes Care* **27**: 2306–11

8

Prevalence of fasting in Muslims with DM: EPIDIAR Study

12,243 people with diabetes

Patients Views:

73% of patients with type 1diabetes

and 55% with type 2 diabetes

agreed that they could break fast during Ramadan

Salti et al. Diabetes Care, October 2004



<u>SOME</u> patients with diabetes fall under this category.

- Do we have evidence of risks during Ramadan?
- How to identify the person at risk with diabetes?
- What criteria to apply?
- Are these criteria agreed by the medical expert opinion?
- Do the religious authorities agree with this?



Q.1 Glycaemic changes during Ramadan The EPIDIAR study data has shown the following: Please choose the right answer

- A. In people with DM who fasted Ramadan, the risk of severe hypoglycaemia increased but that of severe hyperglycaemia was unchanged compared to pre-Ramadan
- B. In people with DM who fasted Ramadan, the risk of severe hypoglycaemia increased but there was a decrease in the incidence of severe hyperglycaemia compared to pre-Ramadan
- C. In people with DM who fasted Ramadan, the risk of severe hypoglycaemia as well as that of severe hyperglycaemia increased compared to pre-Ramadan



Possible Risks associated with fasting in patients with diabetes

Fasting during Ramadan has been discouraged by the medical profession for the **some** patients with DM

Major risks associated with fasting in patients with diabetes:

- Hypoglycemia
- Hyperglycemia
- Diabetic ketoacidosis
- Dehydration and thrombosis

EPIDIAR: Epidemiology of Diabetes and Ramadan 1422/2001 1. Salti I et al (2004) *Diabetes Care* **27**: 2306–11



Risks associated with fasting in patients with diabetes





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Diabetes Care, Volume 27, Number 10, October 2004

Original Article: Treatment Ramadan Education and Awareness in Diabetes (READ) Program for Muslims with Type 2 diabetes who fast during Ramadam

V. Bravis, E. Hui, S. Salih, S. Mehart, M. Hassanein and D. Devendra

Hypoglycaemia in study <u>control group</u> *Ramadan 2007*



Journal compliation © 2010 Diabetes UK Diabetic Medicine, 27, 327-331

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Vildagliptin therapy and hypoglycaemia in Muslim type 2 diabetes patients during Ramadan

D. Devendra, B. Ghel, V. Bravis, E. Hui, S. Salih, S. Mehar, M. Hassanein

Hypoglycaemia in study <u>control group</u> on **Metfromin + Gliclazide** <u>Ramadan 2008</u>





Int J Clin Pract 2009; 63: 1446-50

Hypoglycaemia in sulphonylurea-treated subjects with type 2 diabetes undergoing Ramadan fasting: a five-country observational study

•Total number of symptomatic hypoglycaemic events was 1095

Average (\pm SD) <u>time between the last meal and start of hypoglycaemic</u> symptoms was 8.1 (\pm 3.8) hours.

> Rates of symptomatic hypoglycaemia during Ramadan by country: Israel (40%) - Malaysia (24%) UAE (18%) - India (13%) Saudi Arabia (10%)

> > Aravind SR et al, Curr Med Res Opin 2011; 27: 1237–42.

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Hyperglycaemia

EPIDIAR study show that severe hyperglycemia (hospitalization):

- Type 2 diabetes: increase
 5x
- Type 1 diabetes: increase $3x \pm$ Ketoacidosis



EPIDIAR: Epidemiology of Diabetes and Ramadan 1422/2001 1. Salti I et al (2004) *Diabetes Care* **27**: 2306–11

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Recommendations

Reviews/Commentaries/ADA Statements

ADA WORKGROUP REPORT

DIABETES CARE, VOLUME 28, NUMBER 9, SEPTEMBER 2005

Recommendations for Management of Diabetes During Ramadan

Monira Al-Arouj, md¹ Radhia Bouguerra, md² John Buse, md, phd³ Sherif Hafez, md, facp⁴ Mohamed Hassanein, frcp⁵ Mahmoud Ashraf Ibrahim, md⁶ Faramarz Ismail-Beigi, md, phd⁷ Imad El-Kebbi, md⁸

Oussama Khatib, md, phd⁹ Suhail Kishawi, md¹⁰ Abdulrazzaq Al-Madani, md¹¹ Aly A. Mishal, md, facp¹² Masoud Al-Maskari, md, phd¹³ Abdalla Ben Nakhi, md¹ Khaled Al-Rubean, md¹⁴ in Indonesia, Pakistan, and the Middle East as it is in Europe, North America, New Zealand, and Australia.

The medical ramifications of fasting among patients with diabetes are largely unknown. Due to the limited information available from prospective or retrospective studies on the effects of fasting during

Recommendations



Reviews/Commentaries/ADA Statements

Recommendations for Management of Diabetes Durina Ramadan

Update 2010

Al-Arouj M et al (2010) Diabetes Care 33: 1895–902

BMJ | 26 JUNE 2010 | VOLUME 340

CLINICAL REVIEW

Management of people with diabetes wanting to fast during Ramadan

E Hul, 'V Bravis,' M Hassanein,² W Hanit,¹ R Malik, "T A Chowdhury,¹ M Sulman,⁴ D Devendra¹⁷

Diabetes and fasting in Ramadan: Can we provide evidence-based advice to patients? Sudan Med J 2010:46(1) Diabetes and Ramadan: how to achieve a safer fast for Muslims with diabetes

MOHAMED M HASSANEIN

British Journal of Diabetes & Vascular Disease 2010 10: 246 DOI: 10.1177/1474651410380150



Use of Treatment Guidelines and Changes to Drug Regimens to Manage Patients with Type 1 and Type 2 Diabetes Fasting During Ramadan

P-1171

Table 3. Use of Guidelines and Education Programs

Use of 1 or more guidelines or recommendations for management of diabetes during Ramadan	318 (62.6)
If used, specific recommendations ^a	
ADA 2005 recommendations	124 (39.0)
ADA 2010 recommendations	131 (41.2)
Local guidelines or recommendations	116 (36.5)
Other guidelines or recommendations	42 (13.2)

International Diabetes Federation (IDF) 21st World Diabets Congress; Dubai, UAE; December 4-8, 2011

S Babinaux et al. Johnson Johnson

Very high risk

Sever hypoglycemia within 3 months prior to Ramadan A history of recurrent hypoglycemia Hypoglycemia unawareness Sustained poor glycemic control Ketoacidosis within the 3 months prior to Ramadan Type 1 diabetes Acute illness Hyperosmolar and hyperglycemic coma within the previous 3 months Performing intense physical labor Pregnancy **Chronic Dialysis**

Diabetes Care, Volume 33, Number 8, August 2010 1895



High Risk

Moderate hyperglycemia (average blood glucose 150-300 mg/dl or A1C 7.5-9.0%) Renal insufficiency Advanced macrovascular complications Living alone and treated with insulin or sulfonylureas Patients with comorbid conditions that present additional risk factors Old age with ill health Treatment with drugs that may affect mentation

Diabetes Care, Volume 33, Number 8, August 2010 1895



Moderate Risk

Well-controlled diabetes treated with short-acting insulin secretagogues

Low Risk

Well-controlled diabetes treated with lifestyle therapy, metformin acarbose, thiazolidinediones, and/or incretin-based therapies in otherwise healthy patients.

Note: This classification is based largely on expert opinion and not on scientific data derived from clinical studies.

Diabetes Care, Volume 33, Number 8, August 2010 1895



SOME patients with diabetes fall under this category.

- Do we have evidence of risks during Ramadan?
- How to identify the person at risk with diabetes?
- What criteria to apply?
- Are these criteria agreed by the medical expert opinion?
- Do the religious authorities agree with this?



International Council of Islamic Fiqh: The 19th Conference of International Islamic Council, Sharjah, April 2009

Decision number 183 (19/9) for Diabetes and Fasting¹

- The International Islamic Fiqh Academy reviewed the ADA Ramadan consensus guidelines² and produced based on the evidence of possible risk to people with diabetes if they observe fasting.
- Groups 1 and 2 (very high & high) are exempted from fasting
- Groups 3 & 4 (moderate & low) should attempt to fast

- 1. Beshyah SA (2009) Ibnosina Journal of Medicine and Biomedical Sciences 1: 58–60
- 2. Al-Arouj M et al (2005) *Diabetes Care* **28**: 2305–11



Current gaps in understanding and implementation of better care during Ramadan

<u>Clinical Studies in Ramadan:</u>

- Different regions
- Different types of DM
- Different medications
- Different comorbidities
- Independent studies



Diabetologia DOI 10.1007/s00125-012-2534-0

POSITION STATEMENT

Management of hyperglycaemia in type 2 diabetes: a patient-centered approach. Position statement of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

S. E. Inzucchi • R. M. Bergenstal • J. B. Buse • M. Diamant • E. Ferrannini • M. Nauck • A. L. Peters • A. Tsapas • R. Wender • D. R. Matthews





Diabetologia DOI 10.1007/s00125-012-2534-0 Received: 24 February 2012 / Accepted: 24 February 2012 © Springer-Verlag 2012 Q.2 In choosing sulphonylurea for people with T2D wishing to fast Ramadan.

Please choose the right statement/s.

- A. The risk of hypoglycaemia is equal among all sulphonylurea medications in Ramadan
- B. The risk of hypoglycaemia is highest when using Glimperide
- C. The risk of hypoglycaemia is highest when using Glibenclamide
- D. There was no regional variations among Sulphonylurea users while fasting Ramadan

Hypoglycaemia in sulphonylurea-treated subjects with type 2 diabetes undergoing Ramadan fasting: a five-country observational study

	Glimepiride (n=428)	Gliclazide (n=386)	Glibenclamide (n=535)	Glipizide (n=29)	Overall (N=1378)
Country					
India, n (%)	239 (56)	50 (13)	107 (20.0)	0 (0)	396 (29)
Israel, n (%)	48 (11)	0 (0)	170 (32)	29 (100)	247 (18)
Malaysia, n (%)	29 (7)	182 (47)	144 (27)	0 (0)	355 (26)
Saudi Arabia, n (%)	108 (25)	141 (37)	114 (21)	0 (0)	363 (26)
UAE, n (%)	4 (1)	13 (3)	0 (0)	0 (0)	17 (1)

	Glimepiride (n=428)	Gliclazide (n=386)	Glibenclamide (n=535)	Glipizide (n=29)	Overall (N=1378)
SU dose, mg	2.8 ± 1.5	129.3 ± 81.2	10.7 ± 4.6	6.6 ± 2.9	N/A
Duration of SU therapy*, yrs	3.0	4.0	4.0	1.0	4.0
MET dose. mg	1286 ± 641	1487 ± 520	1525 ± 534	1765 ± 411	N/A

Aravind SR et al, Curr Med Res Opin 2011; 27: 1237-42.

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Incidence of Symptomatic Hypoglycemia During Ramadan in 2009 by Treatment Group¹

- 1095 occurred among the 271 patients who recorded ≥1 symptomatic hypoglycemic event
- Most common symptoms reported were: headache (14.5%), sweating (10.2%), tremor (8.5%), and palpitations (7.0%)

Mean daily doses of SUs were: 2.8 mg for glimepiride, 129.3 mg for gliclazide, 10.7 mg for glibenclamide (glyburide), and 6.6 mg for glipizide and for glipi

Hypoglycaemia in sulphonylurea-treated subjects with type 2 diabetes undergoing Ramadan fasting: a five-country observational study

Average (\pm SD) time between the last meal and start of hypoglycaemic symptoms was 8.1 (\pm 3.8) hours.

Rates of symptomatic hypoglycaemia during Ramadan by country:

Israel (40%)

Malaysia (24%)

UAE (18%)

India (13%)

Saudi Arabia (10%)

Aravind SR et al, Curr Med Res Opin 2011; 27: 1237–42.

The incidence of hypoglycaemia in Muslin patients with type 2 diabetes treated with siatagliptin or a sulphonylurea during Ramadan: a randomised trial

S. Al Sfri, A. Basiounny, A Echtay, M. Al Omari, I. Harman-Boehm, G. Kaddaha, K. Al Tayeb, A.S. Mahfouz, A. Al Elq, L Radican, C. Ozesen, H.L. Katzeff, B.J. Musser, S. Suryawanshi, C.J. Girman, M.J. Davis, S.S. Engel, for the 2010 Ramadan Study Group.

proportion of patients reporting **symptomatic hypoglycaemic** events while on sulphonylurea was:

19.7% in the glibenclamide,

12.4% in the glimepiride and

6.6% in the gliclazide.

Int J Clin Pract;1742-1241.2011.

Diabetes & Ramadan Hypoglycaemia & SU

Al-Arouj M, et al. American Diabetes Association 73rd Scientific Sessions, June 21–25, 2013, Chicago, USA;

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Management of people with diabetes wanting to fast during Ramadan

E. Hui, M. Hassanein, W. Hanif, R. Malik, T.A. Chowdhury, M. Suliman, D. Devendra

Vildagliptin therapy and hypoglycaemia in Muslim type 2 diabetes patients during Ramadan

D. Devendra, B. Ghel, V. Bravis, E. Hui, S. Salih, S. Mehar, M. Hassanein

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Vildagliptin therapy and hypoglycaemia in Muslim type 2 diabetes patients during Ramadan

D. Devendra, B. Ghel, V. Bravis, E. Hui, S. Salih, S. Mehar, M. Hassanein



12 times fewer hypoglycaemic events with Vildagliptin.

© 2009 Blackwell Publishing Ltd. Int J Clin Pract. October 2009. 63, 10. 1446-1450.



VECTOR: Results – Hypoglycaemic events (HE)

Mean between-group difference in patients, who experienced at least one HE was -41.7% (*p* = 0.0002)

	Vildagliptin cohort $n = 23$	SU cohort $n = 36$
$\begin{array}{l} HEs^*\\ & Experienced \geq 1 \ event\\ & Mean\ (SD)\\ & Range\\ & 95\%\ Cl\\ & Total\\ \mathbf{Severe}\ (grade\ 2)\ HEs^*\\ & Experienced \geq 1\ event\\ & Mean\ (SD)\\ & Range\\ & 95\%\ Cl\\ & Total\\ \end{array}$	$ \begin{array}{c} 0\\ 0.0\\ (0.0)\\ 0\\ (0, 0)\\ 0\\ 0.0\\ (0.0)\\ 0\\ (0, 0)\\ \end{array} $	$ \begin{array}{r} 15\\ 0.9 (1.3)\\ 0-4\\ (0.5 1.4)\\ 34\\ 1\\ 0.0 (0.2)\\ 0-1\\ (0.0, 0.1) \end{array} $
Total	0	1 1

Hassanein M et al. CMRO 2011;27:1367-1374.



VECTOR: HbA1c

Vildagliptin significantly lowered HbA1c (7.7% to 7.2%) versus SU (7.2% vs 7.3%) post-Ramadan. The between group difference being -0.5% (p = 0.0262)



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VIRTUE study: hypoglycaemic event during Ramadan Vildagliptin vs. SU

data from >1300 fasting T2DM from 10 countries



[†]Number of patients with a post baseline assessment of hypoglycaemic events. Hypoglycaemia defined as grade 1 (mild): reported symptoms by the patient and/or blood glucose measurement of <3.9 mmol/L (70 mg/dL) or grade 2 (severe): need for third party assistance [‡]Fisher's exact test

SU = sulphonylurea

Al-Arouj M, et al. American Diabetes Association 73rd Scientific Sessions, June 21-25, 2013, Chicago, USA;

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The incidence of hypoglycaemia in Muslin patients with type 2 diabetes treated with siatagliptin or a sulphonylurea during Ramadan: a randomised trial

S. Al Sfri, A. Basiounny, A Echtay, M. Al Omari, I. Harman-Boehm, G. Kaddaha, K. Al Tayeb, A.S. Mahfouz, A. Al Elq, L Radican, C. Ozesen, H.L. Katzeff, B.J. Musser, S. Suryawanshi, C.J. Girman, M.J. Davis, S.S. Engel, for the 2010 Ramadan Study Group.





Int J Clin Pract;1742-1241.2011.

T2D on Insulin & Ramadan Fasting Mix50 v Mix30



Hui E, Bravis V, Salih S, Hassanein M, Devendra D. Comparison of Humalog Mix 50 with human insulin Mix 30 in type 2 diabetes patients during Ramadan Int J Clin Pract 2010; March 10.



Mix50 v Mix30 Hypoglycaemic events



Hui E, Bravis V, Salih S, Hassanein M, Devendra D. Comparison of Humalog Mix 50 with human insulin Mix 30 in type 2 diabetes patients during Ramadan Int J Clin Pract 2010; March 10.



A Comparative Analysis of Exenatide and Gliclazide During the Month of Ramadan

Bravis, V, Hui E, Salih S. Hassanein M, Devendra D. A comparative analysis of exanatide and gliclazide during the month of Ramadan. *Diabetic Medicine* 2010; 27 (suppl 1): 130.



Gaps in Implementation of Better Care for Diabetes Management During Ramadan



Fasting during Ramadan among pregnant women with diabetes (2)

E. Hui, M. Reddy, V. Bravis, M. Rahman, D. Darko, M. Hassanein

Women were just as likely to discuss fasting with their Imams (10/48) as with healthcare professionals (13/48)

Pre-conception care in Muslim women with diabetes should include education on the risks of fasting during Ramadan

Hui E et al (2011) Oral presentation 32. Abstract O-0630. *IDF 2011, World Diabetes Congress* 4–8 December 2011, Dubai.













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- Establish a network of people with interest from multidisciplinary background
- Present new information
- Share Ideas for the future
- Plan research through a strong network



Gaps in Implementation of recommendation

The Role of Structured Education





DaR-SaFa











Q. 2. How important is Ramadan focused structured education programs?

Please choose the right answer

- A. Very Important role
- B. Important role
- C. Average Importance
- D. Not Important



Ramadan HCP Survey

completed by 766 HCP

- in Turkey160 (25%)
- In UAE by 600 HCP (30%)



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How important is Ramadan focused structured education programs?

■UAE ■Turkey

80 72 70 58 60 50 41.2 40 30 20 14 10 10 4 0.6 0.2 0 Not Important Important Role Very Important Average Importance

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The 3 components of

Ramadan focused diabetes educational program

1) An **awareness campaign** aimed at people with diabetes, health care professionals, the religious and community leaders as well as the general public

2) Ramadan-focused structured education for health care professionals

3) Ramadan-focused structured education for people with diabetes.

Diabetes Care, Volume 33, Number 8, August 2010 1895



Structured education programmes for people with DM Original Article: Treatment Ramadan Education and Awareness in Diabetes (READ) Programme for Muslims with Type 2 diabetes who fast during Ramadan

V. Bravis, E. Hui, S. Salih, S. Mehart, M. Hassanein and D. Devendra

©2010 The Authors Journal compilation © 2010 Diabetes UK. Diabetic Medicine, 27. 327-331.



Hypoglycaemic Events



©2010 The Authors Journal compilation © 2010 Diabetes UK. Diabetic Medicine, 27. 327-331.

Johnson Johnson Diabetes Institute, LLC

Mean HbA1c (%) at 12 months



©2010 The Authors Journal compilation © 2010 Diabetes UK. Diabetic Medicine, 27. 327-331.



Ramadan Focused Structured Education – READ program

- Winner of Diabetes UK educational award in 2008
- Winner of Diabetes Educational Study Group (DESG) of EASD award in 2008
- Winner of Diabetes UK educational award in 2009





Structured Education Programs for Diabetes and Ramadan

Safer Ramadan program

A Collaboration between Dr M Hassanein + DESMOND Group, UK MADAR

Arabic Program

Collaboration Between Dr M Hassanein + SANOFI

Supported by DAR & DESG

Ramadan Conversation Map

Lilly

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2013 - What does the MADAR data show?

- >90% of study participants did not receive previous focused education re diabetes and Ramadan.
- Majority continued the same treatment without any change
- 60% checked home BG during the month of Ramadan ranging from 1 56 times per month (mean of 19)
- 35% suffered mild hypoglycaemic symptoms or BG <70 mg/dl during Ramadan, with 0.5% of which had severe hypoglycaemia.



IDF Congress 2013, Abstract number: ME--1555 Abstract

Chart 1: MADAR Educational Assessment



IDF Congress 2013, Abstract number: ME--1555 Abstract

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IDF Congress 2013, Abstract number: ME--1555 Abstract



Stopping the fast

- People must always and immediately end their fast if:
 - Hypoglycaemia (BG <3.5 mmol/L) occurs.
 - BG reaches <3.9 mmol/L in the first few hours after the start of the fast, especially if insulin, a sulphonylurea or a meglitinide has been taken at pre-dawn.
 - BG exceeds 16 mmol/L.
- Avoid fasting on "sick days".

BG = blood glucose.

Adapted from: Al-Arouj M et al (2005) Diabetes Care 28: 2305-11



Egypt Data	
Hypoglycemia before fasting	26.7%
Symptomatic Hypoglycemia during fasting (≤ 70 mg/dl)	38.5%
No Break fasting due to hypoglycemia	30.1%

Dammam, Saudi Arabia:

<u>23%</u> patients with hypoglycaemia <u>did not</u> break the fasting







DaR-SaFa











DaR-Safe Fasting <u>DaR-SaFa</u>

Participating Countries 2014

- 1. UK
- 2. Egypt
- 3. Sudan
- 4. Morocco
- 5. Senegal
- 6. Turkey
- 7. UAE
- 8. Kuwait
- 9. Saudi Arabia
- 10. Iran
- 11. Pakistan
- 12. India



SMBG in Ramadan



Q4. When considering your MEDICAL advice to your patients regarding fasting Ramadan treated with oral hypoglycaemic agents excluding sulphonylurea, do the following factors play a role?

Please choose the right answer

- A. Very Important role
- B. Important role
- C. Average Importance
- D. Not Important



When considering your MEDICAL advice to your patients regarding fasting Ramadan, do the following factors play a role?

SMBG on diet/OHG not on SU





Recommendations for Management of Diabetes During Ramadan

Update 2010

DIABETES CARE, VOLUME 33, NUMBER 8, AUGUST 2010

Frequent monitoring of glycaemia.

It is essential that patients have the means to monitor their blood glucose levels multiple times daily. This is especially critical in patients with type 1 diabetes and

in patients with type 2 diabetes who require insulin.



SMBG in Ramadan

Self-monitoring of blood glucose is recommended for patients with type 1 or type 2 diabetes who are using insulin where patients have been educated in appropriate alterations in insulin dose

SMBG may be considered in type 2 diabetes not using insulin

- Those at increase risk of hypoglycaemia
- Those experiencing acute illness
- Those undergoing major changes in therapy or fasting eg. Ramadan
- Those with unstable or poor control (HbA1c >8.0%: 64 mmol/mol)
- Those who are pregnant or planning pregnancy

Scottish Intercollegiate Guidelines Network www.sign.ac.uk



Current gaps in understanding and implementation of better care during Ramadan




Closing remarks

- The Quran exempts SOME people with DM from fasting Ramadan as fasting may increase risk of complications. Acute illness *per se* is an exemption from fasting.
- 2. Many people with diabetes fast during Ramadan despite medical risk.
- 3. A person's decision to fast should be made after ample discussion with healthcare professionals concerning the risks involved.



Closing remarks

- People who insist on fasting should undergo pre-Ramadan assessment and receive structured education related to physical activity, meal planning, glucose monitoring, and dosage and timing of medications.
- 5. Structured education focused on diabetes and Ramadan is well received by many patients
- 6. More collaborative work and research is required to improve our understanding of diabetes and Ramadan which should consequently improve the safety of fasting.



Thank you very much! Mohamed Hassanein, Consultant in Diabetes & mhassanein148@hotmail.com

