

Senior talk
Diabetes Management in Hospitalized patients

Objectives

Importance of glycemic control in this population and evidence to support this.

Ways of achieving glycemic control

How are we doing at CUMC- inpatient diabetes mgt on the surgical and medical units.

Recommendations / room for improvement.

The Rationale for tight glycemic control

The role of tight glycemic control in improving outcomes – well established in critical care and surgical literature with improvement in both ICU and in-hospital mortality, decreased ICU stay, decreased infection rates and lower rates of end organ damage.

Evidence supporting this for patients admitted on the wards less established
However, given what we know from ICU literature and pathophysiology- extrapolate that DM control is equally important

Clear association between poorly controlled DM and increased susceptibility to infection
Several aspects of immune system altered in DM- leukocyte/phagocyte function, complement fixation.

Hyperglycemia lead to impaired endothelial dysfunction.

Leading to multiple sequelae- cardiovascular events/decreased delivery of oxygen and nutrients to damaged tissues

May be a procoagulant

Increased length of stay due to DM complications.

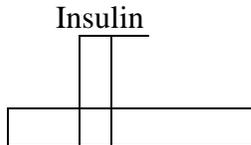
More likely to be transferred to ICU thus increasing costs of hospitalization

Inpatient DM mgt

Oral agents

All relatively safe to use except during specific situations

Metformin usually recommended to be held- pt may go for contrast study issues altered renal function occur commonly in hospitalized pts. Hold secretagogues when pt is NPO, glitazone in case of hepatic or cardiac decompensation.



SS scale regular insulin

Basal Bolus regimens

Correction dose insulin

insulin drip

SSI- place skull head with danger sign here

Origin of this practice unclear but well entrenched hospital mgt of DM- easy! You do not get called

Why do we hate SSI- many reasons

Reactive treatment of hyperglycemia

Use of insulin- based on inadequacy of previous dose/ treating it after the fact- not preventing it.

Provides no Basal insulin.

Most written – with FS premeals- just treating post prandial hyperglycemia

No basal insulin that closely mimics physiology. One author compared it to treating DVT with SQ heparin Q6 as opposed to continuous infusion.

Glycemic control is rarely assessed

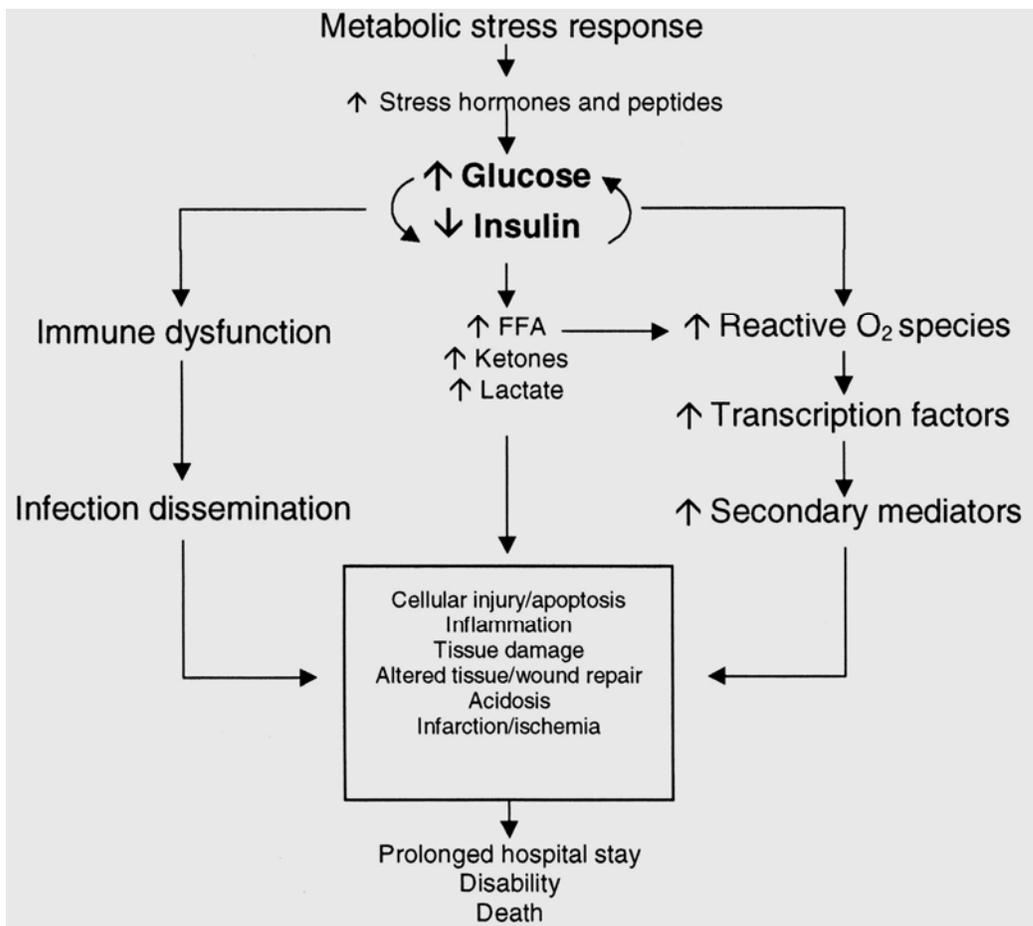
PMD never called, adjustment/ titration never done.

They just get -4u each day for fs >250- nothing done to prevent fs of 250 from repeating itself.

Results in erratic DM control- peaks and valleys, fs check-usually random-q6, no ass. To meals.

May be associated with higher rates of hypoglycemia and hyperglycemia.

Data from 2 articles



Diabetes Care. 2004 Feb;27(2):553-91.

Basal – Bolus regimens

Most closely mimic physiology

Basal insulin- amount of exogenous insulin per unit time necessary to prevent gluconeogenesis and ketogenesis.

Intermediate and long acting insulin preparation used for this.

Bolus insulin- Amount of insulin used to cover prandial needs.

Rapid acting insulins best for this.

Correction dose insulin

-Supplemental insulin we give before meals or between meals

Different from SSI

Defer / decrease dose to avoid nocturnal hypoglycemia

If required frequently- basal insulin regimen needs to adjusted

Do not write SSI to serve as correctional dose insulin.

Again you do not get called so no adjustment is made- the additive effects of insulin can cause hypoglycemia.

Insulin drip

Ideal for pt that is NPO for long periods, DKA, NKH, difficult to control patients

Nurse driven protocol rolling out in 6GS, again this protocol not for use in type 1 or DKA

How are we doing with inpatient DM here

Diabetes management among inpatients on insulin-

-assess efficacy and safety of insulin drip protocol compared to SSI

-Rates of hyperglycemia and hypoglycemia

-retrospective analysis of all pts admitted to 4 hospital wards- 6GS/6GN, 5HN, 7HN

-must be admitted ≥ 48 hrs but less than 10 days.

-Steady state- FS collected starting from day 2&3,, if drip- after 1st 12hrs to 24hrs thereafter.

all FS from capillary blood and serum blood glucose analyzed-WEBCIS- feb to june 2004

Pt s were selected for either regimen by their PMD and insulin dose was titrated by PMDs

Total # patients

Total # FS

SSI- %- % medical , % surgical

Insulin gtt%

Basal/bolus%

Basal bolus /correctional %

	IV insulin	SSI
mean Blood glucose	195+/-11 mg/dl	239 +/-10 mg/dl (p <0.01)
% FS >300	9%	24%
% FS <70	0	3%
Total #	27	33

Lee N et al. Inpatient Management of diabetes Mellitus, Am J Med 2002; 113:317-323

Browning LA, Dumo PJ Am J health syst Pharm 2004;61(15)1611-1614

Van Den Berghe G et al, Intensive insulin therapy in Critically ill Patients, NEJM 2001; 345(19)1359-1367

Clement S et al. Management of Diabetes and hyperglycemia in Hospitals. Diabetes care 2004 Feb;:27(2):553-591.