Brief Communication

The Renal Pentad

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Abstract

Diabetes management is a comprehensive exercise which encompasses not only glycemic control, but vascular risk reduction as well. Accepted clinical models such as the glycemic pentad and metabolic pentad list the glucose related and metabolic aspects which influence ling term vascular outcomes. This paper describes a 'renal pentad' which consists of 5×2 easily measurable parameters, which influence renal outcomes. Renal function ,acute health concerns, chronic health concerns, glycemic control and comorbid concerns from the five components of this pentad. The 5 pointed rubric serves as a teaching and clinical tool, and assists in appropriate choice and targets of therapy in diabetic kidney disease.

Keywords: Albuminuria, chronic renal failure, dyselectrolytemia, eGFR, HbA1c, microalbuminuria

Introduction

The glycemic pentad and metabolic pentad are popular teaching tools in diabetology. These five pointed constructs list five targets of diabetes care and metabolic management, respectively. The choice of these parameters is based on evidence, which connects them with cardiovascular morbidity and mortality. The glycemic pentad, for example, includes HbA1c, fasting glucose, postprandial glucose, hypoglycemia and glycemic variability, all of which are independently associated with cardiovascular outcomes.[1,2] The metabolic pentad helps us think beyond glucocentric control and is an important bedrock of modern diabetes care. Including blood pressure, lipids, weight, and albuminuria, it reinforces the need for comprehensive cardiovascular risk reduction.

The Renal Pentad

While the current emphasis on cardiovascular health is welcome, such models tend to ignore the importance of renal function in diabetic kidney disease (DKD) care and management. We, therefore, propose a renal pentad, composed of 5 objective biomedical domains related to renal function [Figure 1]. The renal pentad includes two easily measurable parameters in each domain. These investigations serve as targets, and also as milestones or audits of ongoing therapy. They act as reminders to ensure comprehensive (as opposed to eurocentric or nephro-centric) treatment of persons with chronic kidney disease.

The renal pentad does not purport to list means of achieving these targets, such as tobacco cessation or use of renin angiotensin system blockers. It does, however, provide a suggested hierarchy with which to evaluate ongoing therapy: assess residual renal function, identify and correct acute potentially reversible medical, metabolic and surgical issues, optimize chronic hematopoietic and bone mineral health, treat comorbid vasculometabolic conditions, and reassess renal function.

Caveats

The reno-oriented rubric that we propose does not include measures of well-being (such as quality of life) of anthropometry (weight). However, we realize the importance of the bio psychosocial model of health and plan to include this in future pedagogic models. The pentad also does not list parameters which are difficult to measure (such as single nephron glomerular filtration rate) or are related to persons on renal replacement therapy. Separate therapeutic tools are being developed for these.

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Table 1: The renal pentad and influence on glucose lowering therapy

Pentad	Domain	Indication	Caveats/contra indication
Renal function	eGFR	Linagliptin and insulin can be used at any eGFR level	Most glucose lowering drugs are contraindicated, or need dose adjustment if eGFR is compromised
	Albuminuria	SGLT2i and liraglutide reduce albuminuria	
Acute health concerns	Dyselectrolytemia	Insulin is treatment for hyperkalemia	Watch for acute kidney injury
	Infection/ obstruction	Insulin should be used in life/organ threatening injection, for perioperative control	Avoid SGLT2i in upper/recurrent urinary tract infection
Chronic health concerns	Iron status	Insulin is anabolic	Pioglitazone may cause anemia
	Bone mineral health		Piogitazone may lead to osteopenia
Diabetes control	HbA1c	Use insulin where indicated	Modern sulfonylureas may be used in lower, once daily doses
	Hypoglycemia	Safer drugs, must be used, e.g., insulin analogues	
Comorbid conditions	Blood pressure	SGLT2i, GLP1RA help reduce systolic blood pressure	Glibenclamide may increase blood pressure
	Lipids	Liraglutide, vildagliptin improve lipid health	Targets for lipid control in CKD are controversial

eGFR: Estimated glomerular filtration rate, SGLT2i: Sodium-glucose co-transporter 2 inhibitor, GLP1RA: Glucagon-like peptide-1 receptor agonist, CKD: Chronic kidney disease

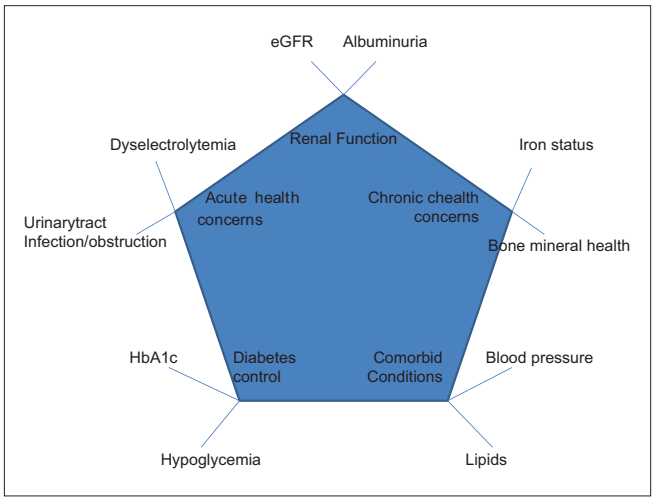

Figure 1: The renal pentad

Utility

The main advantage of this pentad, we feel, is its simplicity. Its ease of understanding allows it to be used by nonnephrologists in virtually all clinical situations that they encounter. It also helps inform the rational choice of glucose lowering therapy in persons with DKD, by highlighting robust indications, caveats, and contraindications related to nephrology [Table 1].

Summary

The renal pentad is a simple model which can be used as a teaching tool, as an aid to clinical decision making, and as a means of auditing or monitoring current therapy. Its simplicity allows it to be used by nephrologists and non-nephrologists alike. At the same time, it is applicable to all persons with DKD, irrespective of this model can be created to serve persons with specific needs such as posttransplant and dialysis patients.

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Conflicts of interest

There are no conflicts of interest.

References

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