EVIDENCE REPORT

Evidence-Based Management of Sickle Cell Disease

Expert Panel Report, 2014

U.S. Department of Health and Human Services
National Institutes of Health
National Heart, Lung, and Blood Institute

http://www.nhlbi.nih.gov/guidelines

Recommendations
5. In febrile people with SCD who have localized or multifocal bone tenderness, especially when accompanied by erythema and swelling, include bacterial osteomyelitis in the differential diagnosis and manage accordingly. ***(Consensus–Panel Expertise)***

Acute Renal Failure

Background

Acute renal failure (ARF) is defined here as a rapid reduction in renal function manifested by a rise in serum creatinine and reduction in glomerular filtration rate (GFR), with or without a decline in urine output. ARF may be due to pre-renal (e.g., dehydration) or post-renal (e.g., obstruction) insults, or result from intrinsic renal disease (e.g., glomerular injury). ARF may occur during an acute VOC, most often in association with ACS or acute multisystem organ failure (MSOF).[163]

Renal papillary necrosis due to medullary infarction from obstruction of the blood supply in the vasa recta affects up to 15–30 percent of individuals with SCD.[164] Signs and symptoms include flank pain and hematuria. When present, fever suggests possible superinfection.

ARF may also occur when individuals with chronic sickle cell nephropathy or other chronic kidney diseases are exposed to nephrotoxic medications (e.g., NSAIDs or intravenous contrast dye) or become dehydrated. People with SCD often display a relative inability to maximally concentrate the urine, resulting in increased vulnerability to pre-renal azotemia.

Due to increased renal tubular secretion of creatinine, serum creatinine values in SCD do not rise until significant renal impairment occurs (GFR of 30 mL/min or less).[39] Since the serum creatinine levels are generally low or low-normal in individuals with SCD, the values in ARF may still be within normal limits even if they have doubled from baseline. It is important to consider non-SCD-related causes of ARF before simply attributing ARF to SCD.[165]

When associated with acute MSOF attributed to diffuse vaso-occlusion, ARF may respond to exchange red blood cell transfusion.[163,166] However, the benefit of transfusion for other causes of ARF in SCD has not been reported. Acute and chronic renal replacement therapy, including hemodialysis, is well-tolerated by people with SCD and should be used when indicated.[163,167]

Key Question

KQ11. In people with SCD and ARF, what are the most effective strategies to reduce mortality and the risk of developing end-stage renal disease (ESRD)?

Summary of the Evidence

The systematic review did not identify comparative studies to demonstrate the superiority of a particular diagnostic or therapeutic approach to ARF in people with SCD. The literature in this area was mostly descriptive of people who developed renal complications (e.g., hyposthenuria, hematuria, impaired urinary potassium excretion and acidification, tubular and glomerular dysfunction, infection, medullary carcinoma, acute necrosis and renal failure).

One RCT, six observational studies, and nine case reports addressing both acute and chronic complications were evaluated. There were no RCTs that addressed acute complications and the single RCT addressed chronic complications; acute renal complications were only discussed in five retrospective observational case series.[40,168-171] No controlled trials or prospective studies addressed the recognition or management of acute renal failure in people with SCD, and few studies addressed evaluation or treatment of renal complications of SCD. The systematic review did not identify any literature to guide diagnostic or management recommendations for renal papillary necrosis. Therefore, management recommendations are based on the application of therapies for ARF from other patient populations to people with SCD as noted in the observational reports.

Recommendations

1. In the setting of an acute rise in serum creatinine of ≥0.3 mg/dL,
   - Monitor renal function daily, including serum creatinine and fluid intake/output. ***(Consensus–Panel Expertise)***
   - Avoid potential nephrotoxic drugs and imaging agents. ***(Consensus–Panel Expertise)***
   - Evaluate the patient thoroughly for all potential etiologies in consultation with a nephrologist as needed. ***(Consensus–Panel Expertise)***
2. Do not give blood transfusions to treat ARF unless there are other indications for transfusion. (***Consensus–Panel Expertise***)
3. Use renal replacement therapy (e.g., hemodialysis) when needed for acute renal failure. (***Consensus–Panel Expertise***)

Priapism

Background

Priapism is a sustained, unwanted painful erection lasting 4 or more hours. Stuttering priapism is the occurrence of multiple self-limited episodes of shorter duration (<4 hours) and can be a harbinger of sustained events.[172] Priapism is a common complication of SCD, affecting 35 percent of boys and men.[173] It is usually of the low-flow ischemic type and characterized by pain and a soft glans. Blood aspirated from the corpora cavernosa of the penis is dark, with a low pO_2, pH, and glucose concentration.[173] Prompt recognition of priapism and initiation of conservative medical management may lead to detumescence and limit the need for more aggressive and invasive intervention. Delayed diagnosis and therapy can result in impotence.

Key Question

KQ12. In males with SCD presenting with acute priapism, what is the relative efficacy of conservative management, pharmacological management, transfusion, and surgery on the outcomes of detumescence and the incidence of future impotence?

Summary of the Evidence

Seven observational studies and 39 case reports described priapism in the setting of SCD. Overall, the quality of the evidence in this area was low due to the observational and uncontrolled design of the available studies.