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Early Symptomatic Relief in Urinary Tract Infection in Children

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Abstract

Background: Gokshuradi Yog used from for strengthening and functioning of genitourinary tract. The study aims to study the role of this Ayurvedic medicine along with antibiotic in early response to treatment of urinary tract infection in children. **Methods:** This study was conducted on 52 children (32 girls and 20 boys). They had symptomatic and culture proven urinary tract infection. They were randomly allotted the treatment group and control group. Patents in control were given the antibiotics for seven days and were evaluated every alternate day for symptomatic relief. Similarly the patients in treatment group were started the antibiotics along with preparation of 'Gokshuradi Yog' for seven days and were evaluated every alternate days. Repeat culture was performed on seventh day of treatment and the final result was evaluated. **Results:** The most common organism grown on culture was Escherichia coli in 39 patients (22 girls and 17 boys). Of the 28 children in treatment group 26 were asymptomatic in 2 days however they continued to be on therapy for seven days. Two patients were symptomatic even after four days, one of whom was culture positive even after 7 days of treatment and was put on intravenous antibiotics. Six out of 24 patients in control group were asymptomatic in two days; the 18 remaining patients were symptomatic even till day seven of treatment out of which two patients were culture positive. **Conclusion:** Patients when treated with 'Gokshuradi Yog' along with the antibiotics brings early symptomatic relief in children suffering from culture proven UTI.

Key words: Ayurvedic medicine, Gokshuradi Yog, Urinary tract infection.

INTRODUCTION

Henoch-Schönlein purpura (HSP) is an IgA-mediated systemic small-vessel vasculitis with a predilection for the skin, gastrointestinal tract, joints, and kidneys.[1] The hallmark is apressure - orgravity - dependent nonthrombocytopenic purpuric or petechial rash.[1] Abdominal pain, arthritis, and nephritis are common.[1] The condition was first described by William Heberden in 1802 who reported a 5-year-old boy with arthralgia, hematuria, abdominal pain, melena and "bloody points" over his legs.[2] In 1837, Johann Schönlein described the association of purpura and arthralgia.[3] In 1874, his former student Edward Henoch described purpura, abdominal pain, and melena as a syndrome and in 1895 went on to recognize renal involvement in this syndrome.[4,5] The syndrome now bears the names of both Henoch and Schönlein.

EPIDEMIOLOGY

HSP is the most common form of systemic vasculitis in children.[6] The incidence is 10 to 14 cases per 100,000 children per year.[7] Approximately 75% of cases occur in children aged between 2 and 11 years, with a peak incidence at 4 to 7 years.[8] The condition is twice as prevalent in boys as in girls.[6,9] HSP occurs throughout the year, but most patients present from fall to spring.[6] The condition is more common among Asians than Caucasians.[7] African-Americans are rarely affected.[10]

ETIOPATHOGENESIS

HSP is the result of a leukocytoclastic vasculitis mediated by an antigen-stimulated increase in levels of IgA, subsequent deposition of IgA antigen complexes in the vasculature of involved organs, and activation of complement pathways which leads to neutrophil accumulation resulting in inflammation and vasculitis without a granulomatous reaction.[6,9] The IgA-mediated vasculitis might result from the interactions of multiple genes and enviromental factors, such as infections, medications, and vaccinations.[7]

There is a genetic predisposition to this condition.[10] Certain human leukocyte antigens (HLA) such as HLA-DRB1*01, HLA - DRB1*07, HLA - DRB1*011, HLA - DRB1*014, and HLA-B35 may contribute to the susceptibility.[6,7,10] In addition, mutations in the Mediterranean fever gene (*MEFV*), located on chromosome 16p13.3, which encodes pyrin could be a contributing factor.[7,11] Genetic variants in the angiotensinogen gene (*ATG*) might also be responsible.[7]

Between 60 and 75% of patients with HSP have a history of upper respiratory tract infection.[1] *Streptococcus pyogenes* is the most common infecting organism.[6,8] Other reported precipitating infectious agents include parvovirus, adenovirus, hepatitis A, B, and E viruses, Epstein-Barr virus, coxsackie virus, varicella-zoster virus, *Mycoplasma pneumoniae*, *Staphylococcus aureus*, *Yersinia*, *Campylobacter*, and *Helicobacter pylori.*[12,15] Drugs such as angiotensin-converting enzyme inhibitors, angiotensin II receptor antagonists, thiazides, nonsteroidal anti-inflammatory drugs, clarithromycin, and cytarabine have also been implicated.[10,16] Other precipitating factors include insect bites, vaccinations (influenza, hepatitis A, hepatitis B, pneumococcus, mumps, measles, and rubella), and α-1 antitrysin deficiency.[14,17-18]

CLINICAL MANIFESTATIONS

The clinical features may be atypical at the extremes of age.[6] The severity tends to be milder in children under 2 years of age and worse in adults.[6,8]

Dermatologic manifestations

A purpuric or petechial rash in a pressure- or gravity-dependent distribution is present in almost all patients with HSP (Figure 1 and Figure 2).[1,19] The face, trunk, palms, soles, and mucous membranes are usually spared.[17] The rash is often symmetrically distributed and is the presenting sign in 50 to 70% of patients; it is usually palpable and does not blanch.[1,6,10] The eruption in children appears in crops and is characterized by its polymorphism in contrast to the eruption seen in adults which is often monomorphic.[10] Some patients have target-like lesions, with each lesion consisting of a central punctate hemorrhage surrounded by circumferential regions of pallor and hemorrhage.[1]

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Bullous lesions are rare, especially if they are hemorrhagic.[20-22]

Musculoskeletal manifestations

Arthralgia or arthritis develops in 65 to 85% of affected patients and is the presenting symptom or sign in 17 to 25% of cases.[1] The frequency of joint involvement is inversely correlated with the patient's age; younger children tend to be more frequently affected.[10] Large joints, such as the knees and ankles, are the most commonly involved, but smaller-joint and spine involvement also occurs.[6-9] The joint involvement is usually symmetrical in distribution, periarticular, and not migratory.[14] Joint symptoms are transient and do not lead to permanent disability.

Subcutaneous edema is reported in 35 to 70% of patients.[1] The edema is usually noted on the dorsa of the hands and feet but may also occur on the scalp, ears, periorbital area, and abdominal wall.[23] Rarely, subcutaneous nodules have been reported.[24]

Gastrointestinal manifestations

Gastrointestinal involvement occurs in 50 to 75% of children with HSP and may precede the onset of purpura in 10 to 20% of patients.[6,8] Abdominal pain, the most common symptom, is typically severe and colicky.[1,8] The pain is usually localized to the periumbilical or epigastric area.[10] Nausea and vomiting are common.[24] Hematemesis and melena might also occur. The gastrointestinal symptoms can be attributed to mesenteric vasculitis with resultant visceral or peritoneal purpura and extravasation of blood and interstitial fluid into the bowel wall and intestinal lumen.[10,14] Intussusception is the most common surgical complication, with an overall incidence of 3.5%.[1,25] Other gastrointestinal complications include intestinal perforation, hemorrhagic ascites, protein-losing enteropathy, acute acalculus cholecystitis, and acute pancreatitis.[14,24,26-28]

Renal manifestations

Renal manifestations develop in 40 to 50% of patients, usually within 1 to 3 months of disease onset.[6] Risk factors for renal involvement include severe abdominal pain with gastrointestinal hemorrhage, age more than 5 years at onset, persistent purpura for more than one month, scrotal involvement, elevated serum IgA, and decreased serum complement C3 levels.[29,30] Hematuria (microscopic or macroscopic) is the most common renal manifestation. Other findings include proteinuria, nephrotic syndrome, and acute nephritis with hypertension.[1] Nephropathy is more severe in children older than 8 years.[1] Persistent hematuria and proteinuria predict the development of end-stage kidney disease.[14]

Genital manifestations

Orchitis is reported in 10 to 20% of boys with HSP.[6] Clinical findings, which include pain, tenderness, and swelling of the involved testicle or scrotum, can mimic testicular torsion. Epididymitis, hemorrhagic or sclerosing ureteritis, hydrocele, scrotal hematoma, scrotal edema, and labial edema have also been reported.[24,31-33]

Neurologic manifestations

Headache and behavioral changes develop in up to 31% of patients.[1,8] Seizures, visual abnormalities, verbal disability, and focal neurologic deficits are reported in only 2 to 8% of patients.[1,34] Rarely, peripheral neuropathy, facial nerve palsy, Guillain - Barré syndrome, and reversible posterior leukoencephalopathy syndrome have been reported.[34-36]

Pulmonary manifestations

Pulmonary complications include diffuse alveolar hemorrhage, interstitial pneumonia, and interstitial fibrosis.[8] In general, pulmonary complications are rare.

LABORATORY EVALUATION

There are no laboratory studies that definitively confirm the diagnosis of HSP, although an elevated serum IgA level is suggestive.[1] Laboratory studies, however, might be necessary to rule out other causes of vasculitis. Anti-neutrophil cytoplasmic antibody (ANCA) titers are normal in HSP but elevated in Wegener granulomatosis.[37]

When renal involvement is present, urinalysis may reveal dysmorphic red blood cells, white blood cells, cellular casts, or protein.[1] Elevated levels of serum creatinine or blood urea nitrogen suggest renal insufficiency associated with the glomerulonephritis of HSP. A depression in levels of serum total protein and albumin associated with proteinuria greater than 1 g/m^2/d suggests nephrotic syndrome.[1]

The hemoglobin is usually normal unless severe gastrointestinal, renal, or pulmonary bleeding occurs, in which case anemia may be noted. Leukocytosis is common. The normal

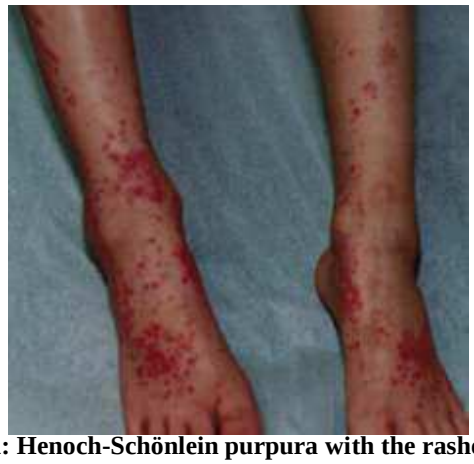

Figure 1: Henoch-Schönlein purpura with the rashes in the ankles- a pressure- or gravity- dependent distribution

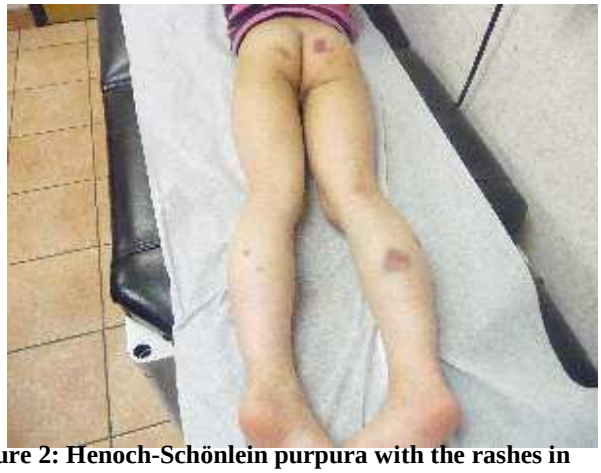

Figure 2: Henoch-Schönlein purpura with the rashes in the left leg and buttock

platelet count differentiates HSP from thrombocytopenic purpura, and normal results of coagulation studies distinguish HSP from primary hemorrhagic disorders.

DISCUSSION

Morbidity due to local symptoms in children suffering from UTI is a major concern for the treating physician and the parents, the early alleviation of these symptoms and proper treatment of active infection is warranted. Ayurvedic preparations have been well known for their anti- inflammatory properties.

Many Ayurvedic preparations have been used in the treatment of UTI. We have selected an ayurvedic preparation which has anti-inflamatory action and it has been proven to alleviate the local symptoms of UTI. Although modern antibiotics are being used in UTIs, urinary tract infections can be quickly and easily treated by supplementing it with a Ayurvedic medicine with no side effects. Herbs known for the management of urinary tract Infections and other urinary disorders divided in important categories:

(a) Urinary antiseptic and anti-adhesion herbs like Juniperus sp., Vaccinium macrocarpon, Salvia officinalis, Punica granatum, Tribulus terrestris, Terminalia chebula, Ocimum sanctum, Cinnamomum cassia, Azadirachta indica and Ocimum sanctum,[8,9] which are effective against major urinary tract pathogens namely E. coli, Klebsiella pneumoniae, Pseudomonas aeruginosa and Enterococcus faecalis (d) Bladder protectives that control bladder and protect from infections comprising of Equisetum arvense, Hydrangea petiolaris and Zea mays[10] (e) Kidney care for instance, Boerhaavia diffusa, Eupatorium purpureum, Agropyron repens and Berberis vulgaris and (f) Herbs for symptoms of benign prostatic hyperplasia, most notably Serenoa repens and Prunus africana. All these herbs are discerned to know different type of phytoconstituents and show potential in the treatment of urinary disorders and could be alternative to uropathogen resistance to the antibiotic during a UTI.

We do not claim the antibiotic effect of 'Gokshuradi Yog' as it had neither been proven earlier nor tested in this study.[10]

CONCLUSION

Patients when treated with 'Gokshuradi Yog' along with the antibiotics brings early symptomatic relief in children suffering from culture proven UTI.

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