

## **Appropriateness Tools to Decide Hospitalization: Are we Ready?**

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One of the major issues faced by India is provision of healthcare services to its ever-growing population. Data from the World Bank shows that the number of beds available for 1000 persons fell from 0.9 to 0.7 from 2005 to 2012 [1]. This is despite the fact that India witnessed unprecedented funding for health through the National Rural Health Mission (NRHM) during the same period. Since 2014, there has been a reduction in funds allocated towards health in the Indian budget [2]. As access to information improves and education levels rise, it is expected that healthcare seeking will increase, and thus the burden on hospitals. The relative reduction of health resources implies that these be used more efficiently. Preventing inappropriate hospitalization is one such crucial step that needs to be taken.

In this issue of *Indian Pediatrics*, Das, *et al.* [3] present the development of the Pediatric Appropriate Evaluation Protocol (PAEP) that is specific to India. This development of the PAEP at the time of launch of Ayushman Bharat is a good coincidence and gives more clarity to stakeholders in the new healthcare program that is being rolled out currently [4].

The literature about PAEP is scant; most of the work on this aspect has happened in developed countries, and mostly over two decades ago. The high-income countries have healthcare systems, which are either insurance-led with multiple payers, or a single payer system that is often the government [5,6]. The insurance coverage often determines how a patient is managed as reimbursement is determined based on appropriateness of interventions. Thus not only hospitalizations, many other interventions are examined from a viewpoint of being reimbursable or not [7]. The relative lack of PAEP studies in the last two decades from the developed world may stem from this fact.

In India, we have a burdened public health system with more patients than beds, coexisting with an out-of-pocket expenditure on private healthcare system (only a miniscule 5% is covered by private insurance) [8]. An

India-specific PAEP will ensure that overburdening of public health systems is addressed while simultaneously reducing the number of unnecessary hospitalizations. As seen in a previous study, minor modifications in the admission policy in hospitals can foster better utilization of the beds [9]. Usage of this tool can allow hospitals to devise new policies for better allocation of resources.

The experts who formulated the Indian version belong to various institutions but none of them seem to be representing the private sector. This is a factor that needs attention as a large percentage of healthcare in the country is provided by the private sector, especially in secondary- and tertiary-care centers [10]. Nonetheless this is a tool that needed to be developed. The next steps would be to use this in various settings across India, and gather evidence for its consistency. Such data will allow further modification or development of a battery of tools that can be used in different settings. Thus, we could have similar tools for hospitalization in surgery units, oncology units, orthopedic units, *etc.* This is needed as previous studies have shown that inappropriate hospitalization and duration is related to location of hospitalization [11].

The tool development process has been rigorous, and its limitations have been well laid out. Hence, it is essential that we understand that the tool while being used to evaluate appropriateness of hospitalization should not be used for rejecting insurance claims or be used in court by dissatisfied parents. It should preferably be used as a tool for improvement in the quality of care that a health facility provides, and for better utilization of resources.

While the appropriateness is relatively high, it may stem from assessment of admissions in hospitals where there are high patient load and a relative lack of beds, and thus only necessary hospitalizations occur. However, in a resource-rich environment, this may not necessarily be true and the inappropriateness may be high as is seen in an Italian study, where daytime hospitalizations were inappropriate with over-cautious

physicians being another factor [12]. An evaluation of the PAEP Indian tool in the private Indian setup may show interesting data.

The development of this tool also shows the need to develop more such instruments to evaluate pediatric inpatients. The appropriateness of duration of admission as well as the quality of discharge summaries and follow-up advice are the other areas that need to be addressed. The improvement in the delivery of healthcare is a continuous process and we need more such tools that have been developed for India to ensure that we deliver care that is contextual, effective and resource-sparing.

*Funding:* None; *Competing interests:* None stated.

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## Current Perspectives in Management of Vesicoureteral Reflux

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Vesicoureteral reflux (VUR) is a major contributor to renal morbidity in children and its management is controversial. The two major goals of management of VUR have been prevention of urinary tract infection (UTI) and renal damage. The treatment options for VUR include watchful waiting, continuous antibiotic prophylaxis (CAP), and endoscopic (injection of tissue bulking substances) and surgical (open, laparoscopic, robotic) strategies. Each of these has certain advantage and disadvantages. Continuous antibiotic prophylaxis (CAP) has been efficacious in reducing the risk of UTI in children with VUR and evidence for the same is based on sufficiently powered studies [1]. However, CAP may be hampered by poor compliance; the Randomized Intervention for Children with Vesicoureteral Reflux (RIVUR) trial showed that one-third of the participating children needed to be withdrawn from the study because of non-compliance [1]. Whether CAP can reduce the risk of renal damage is another area of concern, as in a recent meta-analysis, it was not associated with decrease in new renal scarring [2]. In this context, the endoscopic management of VUR seems to be an attractive option, more so in our set-up, where compliance and long-term follow up can be problematic.

It is with great interest that we read the article by Rao, *et al.* [3] published in the current issue of *Indian Pediatrics*, on the long-term outcomes of more than 500 children and 767 renal units, in which endoscopic management of VUR has been done. As was evident from this study, endoscopic management offers a one-time solution for majority of children with VUR, with a resolution rate of 90% of children. However, we need to remember that resolution of VUR is never the end-point in its management, as the primary aim of treatment remains prevention of UTI and renal damage.

The incidence of febrile UTI after endoscopic treatment had been reported to be in 0.75% of children in a meta-analysis [4]. Rao, *et al.* [3] have shown 96% success in symptomatic relief (preventing UTI),

establishing endoscopic therapy as a reliable treatment option for preventing UTI.

The other major treatment goal, *i.e.*, ability of endoscopic therapy to protect against renal damage is still unclear with only few studies evaluating this outcome. In the present study by Rao, *et al.* [3], a fresh scar was seen in 1% of cases at mean follow-up of 27 months after endoscopic treatment; although, approximately 50% of cases had scars before injection. Similar results in terms of development of new scars have been documented earlier by Chertin, *et al.* [5]. However, they raised concern regarding renal function deterioration on follow-up. Rao, *et al.* [3] have not commented on the deterioration in renal functions; albeit, they have reported that there was no improvement in renal units who had poor function before endoscopic treatment and few of them had to undergo nephrectomy. It will be interesting to know what happens to those renal units on long-term follow-up, in which VUR had been corrected and no fresh scars are formed.

The open surgical treatment of VUR has had a long history, but now with increased knowledge about natural history of VUR, it is now being used more selectively. In a meta-analysis, Wheeler, *et al.* [6] analyzed that surgery has only a minimal benefit over antibiotics alone. Although compliance can be an issue with CAP, open surgery is associated with abdominal incision, hospital stay, temporary urinary catheter, possible damage to trigone, and possibility of bladder dysfunction. In an interesting article published recently, it was seen that after careful explanation, although CAP was parental preference of all children with VUR, approximately 30% of parents also considered open surgery as a mode of treatment [7].

Since the approval of endoscopic treatment of VUR by dextranomer/ hyaluronic acid co-polymer in 2001 by FDA, concerns regarding its long-term success rates and long term complications like delayed ureteral obstructions have emerged [8-10]. Swedish reflux trial reported a recurrence rates of 20% after two years of

endoscopic treatment [8]. Lee, *et al.* [9] reported overall recurrence of 46%. Rao, *et al.* [3], in this study, reported only six late recurrences after many years. This suggests that regular follow-up is required to evaluate the long-term durability of endoscopic treatment, even though postoperative VCUG had shown success of procedure.

It is interesting to note that the popularity of endoscopic injection has decreased in last few years, although the number of open surgical interventions have remained same [11]. The decrease in the popularity of endoscopic treatment can be attributed to evolving concept of benign nature of lower grade reflux, which neither require too much investigations or treatment. For higher grade reflux, open surgical interventions have been used, based on a belief that endoscopic treatment is not dependable for higher grade reflux. In this context, the current study is relevant as it suggests that even for higher grades of reflux, endoscopic treatment by an experienced person can provide good results. The other reasons for decreasing popularity of endoscopic treatment, as suggested by Rao, *et al.* [3], are cost and availability of tissue bulking substance – dextranomer/hyaluronic acid co-polymer.

To conclude, although many guidelines are available for management of VUR, it is still a clinical art in which the clinician has to incorporate many variables like age, grade of reflux, history of previous febrile UTI, existing renal scarring, other urogenital malformations, compliance to treatment, patient's preferences, availability of resources, and available scientific evidence for each mode of treatment, in order to decide the appropriate management strategy with ultimate aim of prevention of recurrent UTI and renal damage.

*Funding:* None; *Competing interests:* None stated.

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