by ORS may result in increase of total body sodium and increase in volume of extracellular water, leading to puffiness. To avoid this complication ORS should be given from the onset of diarrhea with each episode of stool or vomiting, and free water and/or breast feeding continued. It has been suggested that ORS solutions with different sodium concentrations (50-90 mmol/L) should be made available for different age groups in order to prevent problems of hypernatremia and fluid overload(2). However, this would require medical advice to be available at the onset of diarrhea, so as to prevent dehydration and morbidity. As medical advice is often not readily available, there is a possibility of either selection of a wrong type of ORS by the mother or ORS use may be withheld in apprehension of wrong selection. In both situations the most useful preventive role of ORS is jeopardized. Therefore, it is recommended that only one ORS containing 90 mmol/L sodium be used with proper directions printed one each packet. The ORS solution may be administered following each episode of loose motions. Free drinking water and milk should be allowed *ad lib* in between.

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Aminoglycoside Nephrotoxicity in Clinical Practice

The recent article by Bagga *et al.* highlights the important and often neglected issue of gentamicin nephrotoxicity in clinical practice(1). While their recommendations regarding the rational use of this group of drugs are indeed justifiable, the authors have not substantiated with clinical data the incidence of renal function deterioration in their patients who were treated with gentamicin. There is a paucity of information regarding the presence of other reversible and pre-renal factors which would not be uncommon in these hospitalized children. Further, there is lack of clinical data regarding the presence of additional predisposing risk factors. One would also tend to disagree with the criteria of urine casts and proteinuria as basis for the diagnosis of gentamicin nephrotoxicity. It would also be worthwhile to compare the urinary findings in the group of patients showing nephrotoxicity with the rest of 107 patients who tolerated gentamicin well.

Aminoglycosides are indeed the most common cause of drug induced renal failure in hospitalized patients(2). However, they continue to remain the sheet anchor of most antimicrobial regimens in view of their excellent clinical efficacy and low cost. Further, infants and small children can tolerate larger doses than adults and hence have lower incidence of adverse renal effects. Still renal insufficiency represents an additional complication for severely sick children which may prolong hospitalization and increase the economic burden. This nephrotoxicity is dose dependent and usually manifests as polyuria followed in short order by increase in serum creatinine and blood urea nitrogen(3).

The presence of proteinuria and hyaline casts in the urine is nonspecific. Increased excretion of proximal tubular enzymes and beta-2 microglobulin too are only an epiphenomena and hence indicate aminoglycoside effect and not nephrotoxicity(4). Aminoglycosides and creatinine are both good markers of glomerular filtration rate. Hence, it is recommended that simple and inexpensive serum creatinine determinations combined with a limited number of serum aminoglycoside assays be used for monitoring drug efficacy and toxicity(4). The facilities for monitoring drug levels are virtually non-existent in a developing country like India. Thus, for the practicing pediatrician developing a strategy to reduce the risk of aminoglycoside nephrotoxicity requires appreciation of clinical risk factors besides the biochemical monitoring(4). There is a high risk of nephrotoxicity in presence of hypotension, volume depletion, acidosis, concomitant nephrotoxic drug therapy and hypokalemia. In these situations adequate corrective measures should be undertaken along with close biochemical and clinical monitoring. Correct dose adjustment according to renal function and use of lesser nephrotoxic aminoglycoside are the other therapeutic strategies. Last but not the least as highlighted by the authors, the need for a rational use of drugs can not be overemphasized.

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Reply

Eight patients receiving gentamicin showed evidence of nephrotoxicity. Five of these patients were receiving cephaloridine concomitantly. Other predisposing factors including hypotension, volume depletion and hypokalemia were seen in 5 patients. None of these patients had oliguria. Elevated levels of blood urea and creatinine were seen in all the cases.

Aminoglycoside nephrotoxicity is characterized by a variety of renal functional alterations. Reduction of the glomerular filtration rate, manifested by raised levels of serum creatinine, is the *final* manifestation of this disorder. Prior to renal excretory failure, subtle derangements predominated by proximal tubular abnormalities are seen. These include enzymuria, tubular proteinuria and urinary concentration defects. These represent nephrotoxicity and not merely an aminoglycoside effect(1), as suggested by Drs. Gulati and Sharma. Elevated levels of urine beta-2 microglobulin and proximal tubular enzymes are seen 4-5