Table 1 – Cost per test for different assays for detection of HIV infection.

Test principle	Detected parameter	Cost per test (in Rs) ^a
1. Dot immunoassay/ lateral flow assay	Antibody	33.00
2. Immunofiltration/ flowthrough assay	Antibody	71.00
3. EIA	Antibody	18.00
4. EIA	Antigen + Antibody	38.00

^a Costs are approximate.

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Letter to the Editor

Dear Editor,

We have read the article entitled, “A study to determine factors influencing outcomes of pediatric cochlear implants” by Swami et al published in MJAFI 2013; 69:366–368 with great interest. Cochlear implantation is indeed a powerful tool for helping children with severe to profound hearing loss to gain the ability to hear, and to achieve age appropriate communication skills. Despite the impressive skills achieved by many children with CIs, variability in progress remains a significant concern. This study strongly correlates the duration of preimplant auditory deprivation, parental education and cochlear morphology with the outcome. However, we would like to highlight another very important aspect, preservation of residual hearing during cochlear implant surgery, which significantly influences the outcomes of pediatric cochlear implants.

Hearing preservation is becoming increasingly important in cochlear implantation as there is growing evidence that preserving the residual hearing, especially in the low frequencies in combination with the electric stimulation can significantly improve hearing and speech outcomes. It increases hearing performance in difficult or noisy listening environments, improves music perception and appreciation, and gives sound and voices a more natural quality. Preserved residual hearing may lead to the application of “electro-acoustic” stimulation (EAS), where the lower pitches are aided through acoustic amplification and the mid/high pitches are aided through the cochlear implant within the same ear.^{1,2}

Possible causes of residual hearing loss after cochlear implantation include trauma, which can be acoustic trauma while drilling a cochleostomy or mechanical trauma due to electrode insertion resulting in fractures of the osseous spiral

lamina, perforations or disruption of the basilar membrane, or tearing of the endosteum of the scala tympani. The implant insertion can disturb cochlear fluid homeostasis and can introduce bacterial infection. Cochlear fibrosis or osteoneogenesis may result from a foreign body reaction to electrode components, bone dust, or blood.

To preserve residual hearing the following basic strategies have been adapted:

1. Technical alterations in the operative technique of cochlear implantation
2. Use of perioperative steroids
3. Modification in electrode design

Technical alterations in the operative technique of cochlear implantation designed to preserve hearing include: (a) avoidance of acoustic trauma using low speed drills, (b) careful placement of the cochleostomy anterior and inferior to the round window membrane to avoid damage to the basilar membrane and osseous spiral lamina, (c) round window membrane insertion, (d) a small cochleostomy to prevent buckling of the electrode and escape of perilymph, (e) changes in the angle and depth of electrode insertion, (f) slow insertion of electrode.^{3,4}

Steroids are used in conjunction with atraumatic implant surgical techniques because of their hair cell protecting properties in order to reduce the acute insertion trauma as well as the postimplantation inflammation.⁵ However the type, dosage, mode of delivery and the timing of steroid application remains a matter of debate. They can be given preoperative, intraoperative and postoperative, through various routes,

which can be intravenous, intratympanic, via the posterior tympanotomy and by direct instillation into cochleostomy.

Modifications in electrode design include change in its diameter, stiffness and length. The modifications are straight electrode with modiolus facing contacts, shorter, thinner, more delicate and atraumatic electrodes.^{6,7}

To conclude, preservation of residual hearing is possible in cochlear implantation surgery and can result in much better hearing and speech outcomes in pediatric cochlear implants.

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Reply

Dear Editor,

On behalf of the authors, I thank the readers for the deep interest and scholarly analysis of the article. In response to authors concern my reply as below:

There were various parameters selected by the authors prior to carrying out this study which has been outlined in the methodology. However preservation of the residual hearing as brought out by you is a very important aspect of the Cochlear Implantation surgery. We are indeed thankful to you for highlighting this aspect through your correspondence.

There are certain factors which are beyond the control of the surgeons like insertion of the electrodes and the resultant foreign body sensation which cannot be avoided and remains constant. The other surgical modifications as mentioned by you are the integral part of the surgical procedure like small cochleostomy, site of the cochleostomy, use of low speed (rpm) drill, prevention of excessive perilymph escape and slow careful electrode insertion. Being the routine steps of the standard surgical procedure these factors have remained constant for all the cases.

Use of perioperative steroids has still not been proved convincingly as a factor for residual hearing preservation and its usage varies from centre to centre. However it is an important point brought out in your observation.

The variations in the electrode designing as mentioned by you like the modiolus facing electrodes the various lengths and designs of the electrodes in the available implants are now improving the concept of atraumatic insertion and helps in residual hearing preservation.

Your contention that residual hearing preservation is possible in cochlear implantation surgery and can result in much better hearing and speech outcomes in paediatric cochlear implants is indeed well taken. In the modern day implantation these factors need to be emphasised.

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