Hydrogen peroxide as 'defogger' in indirect laryngoscopy

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Abstract

Indirect laryngoscopy examination is a routine clinical procedure for visualizing larynx and hypopharynx. Many methods are described in literature to prevent fogging over the mirror during the examination. Authors have used hydrogen peroxide 0.75% w/v solution as a defogging agent during indirect laryngoscopy examination and found it safe and cost effective.

Keywords Indirect laryngoscopy · Defogging agent · Hydrogen peroxide

Abbreviations: I/L · H₂O₂

Introduction

Indirect laryngoscopy (I/L) is used for visualizing pharynx and larynx. I/L mirror is warmed with naked flame of spirit lamp or hot water to prevent fogging. Studying laryngeal tuberculosis was the realm of the pathologist until the late 1850's. *Manuel Garcia*, in 1854, invented the laryngeal mir-

ror followed by *Dr Johann Czermak*, in 1857, who devised the head-band mirror and used it to reflect artificial light onto the small laryngeal mirror. This made examination of the larynx relatively simple and the specialty of Laryngology was born [1–2].

The resolution of the fiberoptic systems (Hopkins' rigid telescopes) is inferior to that of the mirror and the classical mirror examination remains the preferred technique [3–4]. Apart from naked flame and hot water, other methods to avoid the mirrors from fogging during the examination include heated trays, hot glass beads, and demisting solutions for the lenses on the endoscopes [4].

Material and methods

We have used diluted Hydrogen peroxide solution (0.75% w/v) H₂O₂ as defogging agent on pre-sterilized mirrors in all of our cases, in which the indirect laryngoscopic examination is required. This solution is being used as a mouth wash (1.5%w/v) after tonsillectomy and minor dental procedures. The H₂O₂ solution is dropped over the mirror surface and excessive pouring of H₂O₂ over the mirror is taken care by wiping the mirror with gauze piece. In this way a thin film of hydrogen peroxide is formed over the reflective surface of mirror. The patient is examined with this instrument and no fogging occurs during the whole procedure.

Results

This method of defogging has been used by us for last one year and no untoward incidence has been noticed. As the warming of mirror with spirit lamp has been bypassed, the patient is more cooperative for the examination. There is no damage to mirror surface and / or the quality of the mirror due to hydrogen peroxide solution. This was tested by immersing the I/L mirror in hydrogen peroxide 3% w/v solution for 48 hours and no deterioration in quality of mirror's reflective surface was noted.

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Discussion

Fogging over the mirror surface occurs due to lower temperature of mirror than the body temperature, which in turn causes condensation of water vapour over the mirror surface during expiration of the patient. Mirrors are most frequently warmed by a spirit lamp, despite the fact that the spirit lamp has caused untoward incidences in 125 ENT departments in the UK over the years, such as: injuries by overheating of mirrors, the injuries by patients and staff being burnt by naked flame [5].

The use of hot water is not advisable as the risk of scalding is much greater and repeated use of same water cause cross-infection. (Some departments in UK use baby bottle warmers to keep the temperature of the water constant.) The other problem with water is that it ruins the reflective coating on the mirror due to repeated immersion [4].

Butt has used 70% Isopropyl alcohol to cover the mirror's reflective surface and this prevents fogging just like the more expensive defogging solutions available [4].

When the mirror is warmed by the flame of the spirit lamp, the patient gets worried and apprehensive. The patient thinks that, it may burn his oral cavity or throat. At many places, alcohol for spirit lamps (denatured spirit for medicinal purposes) is not easily available, so H_2O_2 , which is easily available, can be used. Hydrogen peroxide forms a thin film over the I/L mirror, which in turn does not allow condensation of water vapour over the mirror surface, (because of its oxidizing properties).

Conclusion

Use of Hydrogen peroxide 0.75 % w/v is found to be hygienic, safe, easily available and cost effective alternative to the other methods to prevent fogging in indirect laryngoscopic examination.

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