Xenon light microscope

Tissue injuries caused by the thermal effects of xenon light microscopes have previously been reported. Due to this, the development of a safe microscope light source became a necessity. A newly developed laser light source is evaluated regarding its effectiveness and safety as an alternative to conventional xenon light source.

Sato et al. developed and tested a new laser light source for surgical microscopes. Four experiments were conducted to compare xenon and laser lights: 1) visual luminance comparison, 2) luminous and light chromaticity measurements, 3) examination and analysis of visual fatigue, and 4) comparison of focal temperature elevation due to light source illumination using porcine muscle samples.

Results revealed that the laser light could be used at a lower illumination value than the xenon light ($p < 0.01$). There was no significant difference in visual fatigue status between the laser light and the xenon light. The laser light was superior to the xenon light regarding luminous intensity and color chromaticity. The focal temperature elevation of the muscle samples was significantly higher when irradiated with xenon light in vitro than with laser light ($p < 0.01$).

The newly developed laser light source is more efficient and safer than a conventional xenon light source. It lacks harmful ultraviolet waves, has a longer lifespan, a lower focal temperature than that of other light sources, a wide range of brightness and color production, and improved safety for the user's vision. Further clinical trials are necessary to validate the impact of this new light source on the patient's outcome and prognosis [1)].

1)
Sato T, Bakhit MS, Suzuki K, Sakuma J, Fujii M, Murakami Y, Ito Y, Sugano T, Saito K. Utility and safety of a novel surgical microscope laser light source. PLoS One. 2018 Feb 1;13(2):e0192112. doi: 10.1371/journal.pone.0192112. eCollection 2018. PubMed PMID: 29390016.