ANTERIOR SEGMENT EYE DISEASE: EVALUATION OF ARCLIGHT & PORTABLE SLIT LAMP AMONGST CLINICAL OFFICERS IN UGANDA

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Introduction

Early diagnosis of both posterior and anterior segment eye diseases is crucial in reducing global blindness, especially in low-resource settings where eye care professionals are limited (1).

The Arclight is a diagnostic tool designed to meet the needs of these areas, as it combines a direct ophthalmoscope and an anterior segment loupe (Fig 1), and is solar-powered, portable, and cost-effective aiming to overcome many of the barriers to access and continued functionality in resource poor settings (2).

This study aims to assess the accuracy of the Arclight in diagnosing anterior segment eye diseases, compared to a portable slit lamp among patients in Uganda.

Methods

The study was conducted at the Mulago National Super Specialized Hospital in Uganda. 21 Ophthalmic Clinical Officers (OCOs) were recruited who were randomly assigned to start with either the Arclight or Portable Slit Lamp (Fig 2) and examine 10 cases (uveitis, pterygium, ulcer, scar, laceration, hypopyon, trachoma, pseudophakia, cataract, normal). After a 4-hour gap and changing the order of 'disguised' patients the OCOs repeated the examinations with the other device.

The diagnosis and time taken were recorded.

Results

All OCOs had previous training and exposure to the portable slit lamp, and only 6 with the Arclight. 72.3% of the portable slit lamp and 71.2% of the Arclight examinations were correct, with no significant difference between the two devices (Fig 3). The only exception was in the case of corneal scar, where a statistically significant difference was observed, with 71.4% of the OCOs making a correct diagnosis using the slit lamp compared to 38.1% using the Arclight (p=0.019). The median time taken for a diagnosis was also comparable, at 25 seconds for the portable slit lamp and 26 seconds for the Arclight (Fig 4).

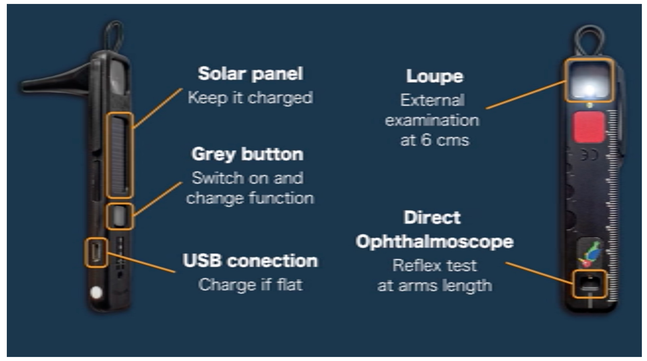

Figure 1. Arclight Device

Figure 2. Examination of 'disguised' patients with mask, cap and gown with slit lamp

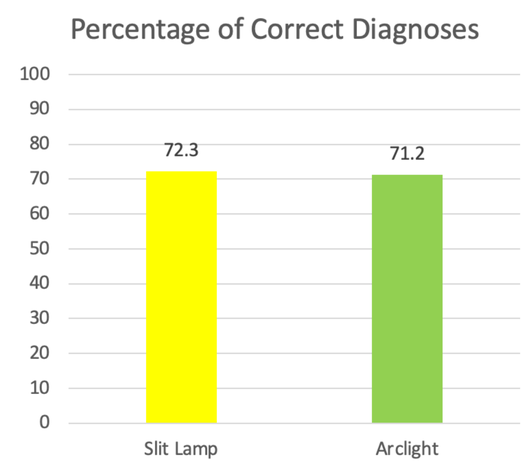

Figure 3. Percentage of Correct Diagnoses

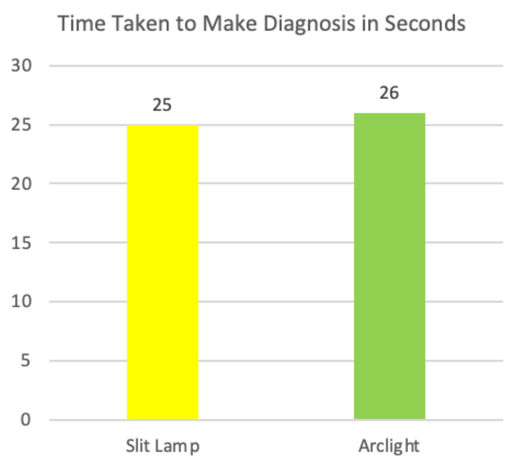

Figure 4. Time to Diagnosis

Discussion

The findings of this study demonstrate that, in the hands of an OCO, the anterior segment loupe of the Arclight device serves as an effective and cost-efficient substitute for the portable slit lamp in identifying anterior segment disorders commonly encountered in resource-limited settings.

The results align with the outcomes from previous research that compared the ophthalmoscope and otoscope capabilities of the Arclight device to more expensive conventional tools (3). These studies also concluded that despite its low-cost and straightforward design, it serves as a comparable and suitable diagnostic tool for detecting posterior segment eye disease as well as ear disorders.

Limitations such as monocularity and inability to produce slits may hinder its usage in certain cases.

Despite these limitations, the device has advantages such as simplicity of use, price, portability, being solar powered and having several many other functions including ophthalmoscopy.

Conclusion

In conclusion the Arclight can be a valuable alternative multi-tool for diagnosing common anterior eye segment diseases seen in resource-poor settings where access to slit lamps is limited.

References

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