Short Communication

Intensity of Quartz-Tungsten-Halogen Light Polymerization Units Used in Dental Offices in Brazil

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Purpose: To determine the intensity of quartz-tungsten-halogen light polymerization units in dental offices in El Salvador, Brazil. ***Materials and Methods:*** A team of researchers visited 100 offices in 2003. The team measured light intensity with a radiometer. The age and make of the units and the availability of light meters were recorded***. Results:*** One hundred twenty quartz-tungsten-halogen units were tested. Intensity ranged from 10 to 1,000 mW/cm^2, with mean of 255.8 mW/cm^2. Almost half (48%) of the units had values equal to or less than 200 mW/cm^2. Their age ranged from 1 to 21 years. None of the offices had light meters. ***Conclusions:*** Clinicians should periodically monitor light intensity and carry out maintenance on their light polymerization units. *Int J Prosthodont 2005;18:434–435.*

The use of resin composites in dentistry continues to increase. However, recent studies conducted to measure the intensity of light units used for polymerization of resin composites in private dental offices in 3 different locations indicated wide variability, from 11 to 1,368 mW/cm^2.[1–3] The conclusion from these studies was that the light intensity used in many private offices was lower than the minimum needed for optimal polymerization of resin composites.

The aim of this investigation was to determine the light intensity and heat/glare emissions of quartz-tungsten-halogen (QTH) light polymerization units used in a sample of dental offices in Salvador, Bahia, Brazil, to determine whether the clinicians noticed the above-mentioned studies and adopted measures to improve the light intensity of units in their offices.

Materials and Methods

Dental offices were selected in Salvador, Bahia, Brazil, on the basis of specific criteria, including that the participating clinician was placing posterior composite restorations on a routine basis. A trained team of research assistants visited the offices over a period of a few months in the year 2003. The team was instructed on how to measure light intensity and heat/glare with radiometers. At each office visit, an analog radiometer, with a range from 0 to 1,000 mW/cm^2, was used (Optilux, Model 100, Kerr) to determine light intensity. Following a short warm-up period, several measurements of light intensity were made. A heat/glare radiometer, with a range from 0 to 300 mW/cm^2 (Optilux, Model 200, Kerr) was used to determine heat/glare emissions. Several heat/glare measurements were also made. The age and make of polymerization units, as well as the presence of a light meter in each office, were recorded. Mean light intensity and mean heat/glare emissions for each polymerization unit were determined.

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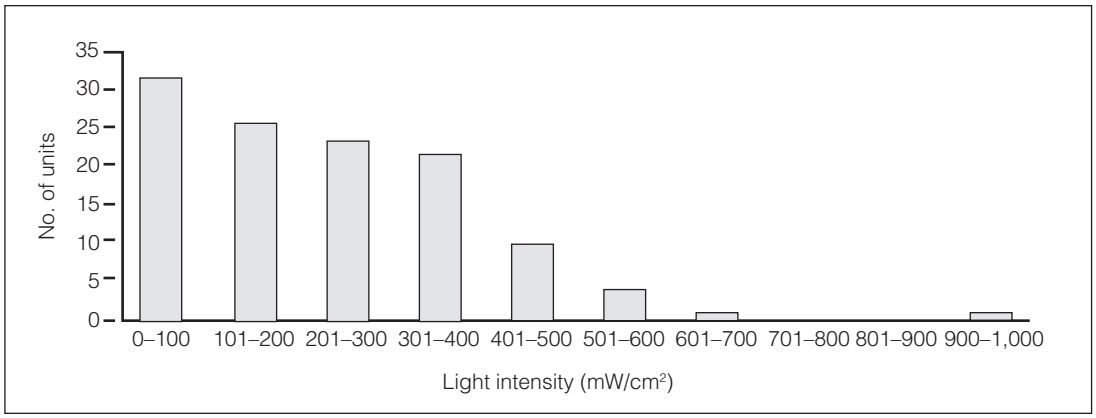

Fig 1 Distribution of light units by intensity.

Results

A total of 120 QTH light polymerization units found in 100 dental offices were tested. Light intensity varied considerably among the offices with mean measurements ranging from 10 to 1,000 mW/cm^2 with an overall mean value of 255.8 mW/cm^2 (Fig 1). More than half (56%) of the units had mean intensity values less than 300 mW/cm^2, the critical lower level of acceptable range.[4] Current literature indicates that higher light intensity is desirable to ensure thorough polymerization.[5] These values found in Bahia are much lower than what was previously reported[1–3] and as a result are alarming. Mean heat/glare measurements ranged from 10 to 250 mW/cm^2 with 23% of the units having mean values equal to or greater than 50 mW/cm^2, the maximum permitted limit. Age of units ranged from 1 to 21 years. None of the dental offices visited had a light meter.

Conclusions

A considerable number of the light polymerization units emitted light with intensity below critical levels. Similarly, a high percentage of the units emitted heat/glare values greater than the maximum recommended limit. Dentists should be encouraged to periodically examine light intensity of units in their offices and carry out maintenance services as necessary. This will ensure optimum polymerization of resin composite restorations.

Acknowledgments

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