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FJ Trevor Burke

(NOT) Seeing the light

I hope that readers enjoyed the excellent Dental Materials special issue, which included a comprehensive assessment of light curing by Steve Bonsor and Will Palin.[1] They recommended that 'members of the dental team using dental LCUs be aware of the potential damage to eyesight that these devices may present'. As a previous detached retina patient (which the surgeon suggested might be caused by me having looked at too many blue curing lights in the early days of research on the topic), I took their warnings on board. Another recent article on the subject[2] has also spelt out the risks on the potential hazards of using dental light curing units (LCUs), so it may be appropriate to add what that stated, given that a further article[3] suggested that there may be considerable variations on dentists' safety awareness with regard to dental LCUs.

The comprehensive article by Richard Price's team[2] is worrying reading, given that it suggested a variety of hazards caused by bright blue lights, for example, soft tissue burns (therefore, do not shine the LCU directly on unprotected mucosa), but especially the 'blue light hazard' caused by high levels of blue light. This refers to the photochemical damage to the retina caused by short-wavelength electromagnetic radiation from 400 to 500 nm, with the most damaging being 420 to 455 nm, these being the wavelengths emitted by most dental LCUs. Additionally, blue light is all around us and is said to help regulate our circadian rhythms, with a report by the American Medical Association warning that blue light from LEDs in streetlamps can disrupt this.[4] In the dental setting, bright white LED operating lights contain large amounts of blue light, and clinicians stare at brightly lit dental surfaces and metal instruments for hours each working day. Additionally, for clinicians using a microscope, ocular exposure to blue light may be enhanced unless appropriate filters are employed.[5] The message, therefore, is very clear to all members of the chairside dental team: use appropriate eye protection, namely, orange goggles or glasses that are designed to protect against the wavelengths of light from dental LCUs.[2]

'Seeing the light' might also be taken to mean suddenly understanding something that one didn't previously understand. In this regard, there has been substantial discussion following publication of an article describing the treatment of moderate tooth wear by crowning anterior teeth.[6] The contemporary view for treatment of tooth wear has been addressed in two previous Comments this year, with the 'evidence' being firmly in favour of the use of resin composite restorations placed at an increased occlusal vertical dimension. If I had not quoted sufficient articles on the topic, further (in my view) conclusive proof has been published in recent weeks by Dr Shamir Mehta and colleagues from King's College London and the University of Nijmegen in the Netherlands.[7] They followed 34 patients with 'severe tooth wear' for 5.5 years (mean observation time being 39.7 months), with the patients receiving full-mouth rehabilitation using direct resin composite anterior and posterior restorations, the number of restorations totalling 1269 (in 676 anterior, 593 posterior teeth, with 700 in the maxillary arch and 569 in the mandibular arch). Restorations were placed at an increased occlusal vertical dimension based on an

estimation of the inter-occlusal space needed to permit the use of resin composite restorations in order to provide restoration of occlusal form. A 'lip generated smile design' was also used. Treatment was carried out over '3 to 5, 3-hour sessions' by five operators with experience in the technique. Failures were classified into Level 1 (severe deficiency), Level 2 (localized defects) and Level 3 (a restoration with small material chips). Restorations that required polishing were considered part of the required refurbishment, with the authors stating that patients were made aware of the need for these maintenance needs. At 5.5 years, 2.3% of restorations showed catastrophic (Level 1) failures, with molar restorations and anterior restorations requiring additional sessions for completion (which I took to mean probably more difficult or extensive restorations) being associated with significantly higher risk of failure. Level 2 (reparable) failures were 7.3%. The authors concluded (in my view correctly) that the failure rates justified the application of their approach for the medium-term management of patients with generalized severe tooth wear. For those who are sceptical of this treatment concept, I feel assured that this work demonstrates how adhesive techniques are of value in the treatment of severe tooth wear.

I recently attended a dental research meeting in Belgium, and it was refreshing to be at a 'live' meeting again. I had the opportunity to talk to dentists from around Europe, and while those may not be more than a convenience sample, it was clear that, in many countries, dental practice life had returned to something approaching the normal. In the UK, we are still awaiting definitive guidelines by our authorities on the level of PPE needed and the risk regarding a dental aerosol. Perhaps it is time that those who set the rules also 'saw the light' and provided the much-needed guidance that is long overdue?

Finally, I know that many readers have used Professor Samaranayake's COVID Commentary as their definitive up-to-date guide to matters related to COVID-19. We mentioned a few issues ago that this would appear in alternate issues, but our esteemed author has advised me that, as COVID becomes endemic in increasing numbers of countries, he will write a Commentary when there is something new to report.

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