



BMLA Annual Conference & Educational Courses

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Heathrow Airport, UB7 0DU
www.bmla.co.uk
BMLA 1 Port-Wine Stains

Introduction

Port-Wine Stains are benign congenital capillary malformations seen in 0.3-0.5% of new-borns with equal sex distribution. They vary in size, location, colour and thickness and tend to become darker and thicker with age. Early treatments are important as untreated lesions cause clinical issues, long lasting emotional and social difficulties. Lasers and other treatments have been used successfully, but there is a lack of standardized guidance for treatment modalities.

Objectives

To provide up-to-date, evidence-based recommendations for the laser and light-based treatments for PWS in children under the age of 18 years.

Methodology

Ovid (PubMed, MEDLINE and Embase, and the Cochrane Library) database was searched for meta-analyses, randomized and non-randomized controlled clinical trials, open studies and case series from 1948 to February 2018 using following search: “Birth marks”; “PWS” ,Children”. The literature was appraised, and key point recommendations were developed.

Results

Lasers are the main treatment option. Pulsed dye laser (PDL) and neodymium-doped yttrium aluminum garnet (Nd:YAG) have been used effectively for the treatment as well as Potassium-titanyl-phosphate (KTP), alexandrite and diode lasers.

Multiple treatments are required to achieve satisfactory clearance. Nd:YAG (1064 nm) or carbon dioxide lasers should be considered for the treatment of hypertrophic and nodular lesions. Photodynamic therapy and intense pulse light can be used in selected cases. Caution is required in considering general anaesthesia at early age and older children may tolerate treatment with local anaesthetic gel or cream.

Conclusion

PDL has become the treatment of choice. Early treatment is beneficial and addition of Nd:YAG laser or other treatments should be considered in selected cases.

Acknowledgements

These guidelines have been prepared by the following authors on behalf of BMLA:

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SS01 Use of PDT and Laser in Thoracic Surgery

Mr Maninder Singh Kalkat¹, **Vanessa Rogers**¹

¹Birmingham Heartlands Hospital,

Session 1 - Surgical and Skin Lasers, Discovery Room, May 9, 2019,
09:00 - 10:30

Biography:

Maninder Singh Kalkat was appointed Consultant Cardiothoracic Surgeon at Birmingham Heartlands Hospital in Birmingham in 2006. He has been Clinical Director of the Regional Department of Thoracic Surgery for past four years and also works as a lung transplant surgeon at University Hospital Birmingham.

His field of expertise includes minimally invasive thoracic surgery involving lungs and mediastinum. His special interests include airway management and resection/reconstruction of the chest wall for soft tissue and bony tumours.

He has strived to ensure that the department provides safe, cost effective and quality service to the patients. This has been possible by creating an environment where every member of the team is appreciated and supported for the job they perform.

He is organizer and faculty member of various National and International courses and examiner for the Intercollegiate Speciality examination in Cardiothoracic Surgery.

Lung cancer is the third most common diagnosed cancer in England, but accounts for the most deaths. The UK has low lung cancer survival when compared with European comparators. Estimated five-year survival (2010-2014) among the lowest in Europe.

Less than quarter of all lung cancers are diagnosed at an early stage, where treatment with curative intent could be considered. The surgical resection remains treatment of choice for these patients diagnosed at an earlier stage. However, occasionally the physical fitness and associated comorbidities may preclude surgery and alternative treatment strategies need to be explored. PDT (Photodynamic Therapy) is one such option which can be used to treat early stage endobronchial cancer in patients unsuitable for resection. Apart from photosensitivity there are minimal adverse effects reported and PDT is associated with complete remission rates ranging from 62% to 85%.

The majority of patients with lung cancer report late and are inoperable. These are treated with other oncological treatment including chemo and radiotherapy. Not infrequently, these patients have centrally placed tumours obstructing the airway and resulting in shortness of breath, collapsed lung and consolidation. This not only effects the quality of life of the patient but interferes with the oncological treatment. The disobliteration or removal of the endobronchial tumour is required to re-establish the patency of the airway and improve patients’ symptoms. The use of thermal laser has revolutionised the endobronchial treatment of advanced cancer, allowing precise and safe ablation of the tumour mass with minimal bleeding.

INV01 Vascular anomalies of the lips, the tongue and the mouth: management with laser technologies

Professor Enrico Bernè¹

¹Magenta Medical Center-Milan, Milan, Italy, ²Katia Arcieri, Milan, Italy, ³Filippo Balconi, Milan, Italy

Session 1 - Surgical and Skin Lasers, Discovery Room, May 9, 2019, 09:00 - 10:30

Biography:

Enrico Bernè M.D. teaches seminars and workshops for Development of Laser Technologies, he is a Professor at Department of Surgical Sciences and Radiodiagnostic integrated at Genoa University, Enrico's speciality is Laser Treatment of Vascular Anomalies. Enrico is a Medical and Scientific Chief in his-own Clinic at the Magenta Medical Center, Institute for Study and Care of Vascular Anomalies, Milan, Italy.

Background and objectives

Vascular anomalies of the mouth (lips and tongue also) are, in great parts venous and lymphatic (or both) but laser treatment became difficult with devices of transdermal vascular lasers (i.e. long pulsed lasers at 595 nm, 532 nm and 1064 nm). In these cases, the diode laser (980-vs 1470 nm) and optical fibres offers the best solution.

Material and method/Results

Optical fibre technologies were born in the early '90's with endovascular laser treatment on saphenous insufficiency (EVLA technique). The diode laser 980-1470 nm with optical fibre became the best approach with intralesional techniques for low flow anomalies.

In 25 years of experience, the employment of diode laser 980-1470 nm and O.F has permitted the super selective photocoagulation of vascular lesions in the oral area with 90 % of resolution at the first session and 99% at the 2nd session. The 0-2 % recurrence was related to low-flow AVF.

Conclusions

Authors reports their work during 25 years of laser experience on 535 pts with low-flow vascular anomalies treated with diode laser and optical fibre.

OP01 Solution for periorbital dark circles

Dr Sanjay Rajpara¹

¹Aberdeen Royal Infirmary,

Session 1 - Surgical and Skin Lasers, Discovery Room, May 9, 2019, 09:00 - 10:30

Background and aims: Periorbital dark circles contribute to tired, aged and sad look across all cultures of the world. The degree and severity of these varies depending on the skin type, age and life style. The reasons are bone volume loss, fat pad decent, volume loss and absorption and tightening of the facial and orbital ligaments. Possible treatment options include CO₂ and other lasers, fillers, chemical peels, skin lightening creams and surgical blepharoplasty. One option does not work for all. We share our experience of treating this common problem.

Methods: In a private practice setting in the UK and India, we have treated 30 patients with different Fitzpatrick skin types. 16 subjects were treated with fillers, 6 with lasers and 8 with fillers and lasers. Pre and post treatment photos were taken and subjective and objective outcomes in appearance were reported as poor, fair, good or excellent.

Results: 6 subjects had type 4, 3 had type 5, 5 had type 1 and 16 had type 2 skin. 24 subjects had excellent and 3 subjects each had very good and good subjective and objective outcomes.

Conclusion: Non-surgical treatments are effective treatment for dark circles with minimum or no complications and downtime.

References:

Vrcek I, Ozgur O and Nakra T. Infraorbital Dark Circles: A Review of the Pathogenesis, Evaluation and Treatment. J Cutan Aesthet Surg. 2016 Apr-Jun;9(2): 65–72.

Kashkouli MB, Abdolalizadeh P and Abolfathzadeh N et al. Periorbital facial rejuvenation; applied anatomy and pre-operative assessment. J current ophthalmol. 2017;(29): 154-168.

OP02 What home IPL hair reduction devices do and are they effective?

Dr Godfrey Town¹

¹GCG Healthcare Ltd, Haywards Heath, United Kingdom

Session 1 - Surgical and Skin Lasers, Discovery Room, May 9, 2019, 09:00 - 10:30

Biography:

Godfrey is RPA2000 certified in Non-Ionising Radiation protection, a Registered Clinical Technologist, holds a Cardiff University Law School Expert Witness Certificate, is an ASLMS Fellow and a member of ESLD and BMLA. He has published over 25 peer-reviewed scientific and clinical papers, sits on IEC, CENELEC and ANSI standards committees.

This review charts the progress of laser/IPL hair reduction from high fluence professional devices to low fluence home-use appliances, summarises literature reviews on home-use devices (HUDs) for hair removal, provides an explanation of differences in light delivery methods and probable divergences in mode of action and reports opinions on home-use devices gathered from healthcare professionals around the world. Literature searches were performed, and recent clinical study data is presented to review progress of laser/IPL hair reduction.

Recent studies indicate that fluences of only 2-4 J/cm² can lead to induction of catagen, and prolonged treatment cycles such as those associated with at-home use produce stable hair growth delay greater than the duration of the complete growth cycle of hair follicles.

Numerous uncontrolled and controlled clinical efficacy studies and technical safety investigations support many of the leading manufacturers' claims.

Safety remains the primary concern as HUDs may be accessible to children or use attempted on unsuitable skin types without full awareness of potential side effects. A likely explanation of the probable mode of action in low fluence optical energy hair reduction is provided.

Safety of light-based HUDs typically is assured via design and engineering controls such as safety switches, alarms and sensors to prevent incorrect operation or eye exposure.

Sufficient positive arguments exist for practitioners to make the case to patients for HUDs as 'companion' products to professional treatments.

The role of HUDs for hair removal and cleansing is already established as an adjunct to professional in-office treatments with high professional awareness.

OP03 Hairy mouths: a simple solution to a hairy problem.

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Session 1 - Surgical and Skin Lasers, Discovery Room, May 9, 2019, 09:00 - 10:30

Biography:

Foundation year 1 doctor at Southmead.

The excision of an oral malignancy may involve complex reconstruction in the oral cavity. Intraoral structures are reconstructed using soft tissue skin grafts or flaps which may be taken from hair bearing skin sites such as the arm or leg. Postoperative hair growth in the oral cavity can impact a patient's quality of life by leading to discomfort as well as poor oral intake and hygiene.

The aim of this case series is to raise awareness of a simple and effective method of removing intraoral hair grown from skin flaps used in oral reconstruction.

We present 6 men with oral malignancy aged between 41-75 years, who underwent oral reconstruction using soft tissue skin flaps with hair bearing skin from either the arm or leg. Each patient received between 3 and 7 sessions of laser hair treatment with a Long Pulse Alexandrite Laser (Quantas Duetto or Cynosure Elite). Power varied for each treatment ranging between 16-30 J/cm² and pulse duration between 14-40 ms, spot size remained the same at 14 mm. All patients received treatment both

with and without air cooling and cold water was provided after each treatment.

All achieved excellent results with either full suppression or good reduction in hair growth, requiring minimal top up sessions. They reported no difference in perceived discomfort with or without cooling and treatments were well tolerated with no complications.

Laser hair treatment is a safe, effective and well tolerated method of improving a patient's quality of life following postoperative hair growth in the oral cavity.

INV09 BAD Guidelines and Service Standards

Professor Sally Ibbotson¹

¹University Of Dundee, Ninewells Hospital & Medical School, Dundee, United Kingdom

Session A: PDT, Endeavour Room, May 9, 2019, 09:00 - 10:30

Biography:

Sally Ibbotson is Professor of Photodermatology and Head of the Photobiology Unit and Scottish Photobiology Service. She is Clinical Director of the Scottish Photodynamic Therapy Centre and Co-Director of the Clinical Research Centre. She is a major contributor to PDT Standards and Guidelines and has >180 publications and H-index 39.

The place of topical photodynamic therapy (PDT) for superficial basal cell carcinoma, Bowen's disease and actinic keratoses has been robustly evaluated in large multicentre clinical trials, usually in comparison with other more conventional therapies. The high efficacy in selected patients and the acceptable profile of adverse effects, with high levels of patient satisfaction have confirmed its place in dermatology practice. Interestingly, topical PDT has a much stronger evidence base in support of its use than other therapies, such as cryotherapy and topical chemotherapeutic agents. The British Association of Dermatologists has recently revised and updated the guidelines for use of topical PDT (Br J Dermatol. doi: 10.1111/bjd.16441), in parallel with undertaking a systematic review of the use of topical PDT for basal cell carcinoma (Br J Dermatol. 2018; 179:1277-1296) and a review of the adverse effects of topical PDT (Br J Dermatol. doi:10.1111/bjd.17131). Thus, a summary of the place of topical PDT and guidelines for its application and use will be discussed, along with the recently finalised BAD standards for the use of topical PDT. These include bench marking relating to the process of setting up a PDT clinic and the necessary training and education required for those involved in delivering a PDT service and the expected outcomes and tolerance of treatment (www.bad.org.uk/healthcare-professionals/clinical-services/service-guidance/pdt). This presentation will discuss the current use of topical PDT in the context of these guidelines and service standards.

OP12 Sunscreen choice for maximal dose delivery in daylight photodynamic therapy

Dr Paul O'Mahoney^{1,2,3}, Dr Marina Khazova⁴, Prof Sally Ibbotson^{1,2,3}, Dr Ewan Eadie^{2,3}

¹University Of Dundee, Dundee, United Kingdom, ²Photobiology Unit, NHS Tayside, Dundee, United Kingdom, ³The Scottish Photodynamic Therapy Centre, Dundee, United Kingdom, ⁴Public Health England, Didcot, United Kingdom

Session A: PDT, Endeavour Room, May 9, 2019, 09:00 - 10:30

Biography:

Paul O'Mahoney is a Post-Doctoral Research Assistant working within the Photobiology Unit at Ninewells Hospital. He obtained his PhD in Physics in 2015 and BEng (Hons) in Mechanical Engineering in 2011, from the University of Dundee.

His research is focused on the applications of physics in Photodynamic Therapy and Photodiagnosis.

Daylight photodynamic therapy (dPDT) is an effective and patient-preferred treatment for the management of field-change actinic keratoses (AK; chronic sun damage). Prior to dPDT, sunscreen is applied to all skin

that will be sun exposed, to limit ultraviolet (UV) exposure to these already chronically sun-damaged sites. In dPDT, a photosensitiser pro-drug cream is applied to the AKs and the affected areas exposed to daylight for at least 2 hours, with visible and long-wavelength ultraviolet-A (UVA) components initiating dPDT effects.

Modern sunscreens can be very effective at attenuating UVA wavelengths, with a UVA star rating often accompanying the ubiquitous SPF label. It was hypothesised that the spectral content of daylight required to activate photodynamic processes may overlap with the spectral attenuation of the sunscreens, thus reducing the dose of light that patients receive during dPDT. A minimum dose of light should be delivered to the skin to ensure as effective treatment as possible, therefore any reduction in dose is of great importance.

We determined the spectral transmittance of several sunscreens and applied these profiles to a representative daylight spectrum, weighted for the action spectrum of protoporphyrin-IX (PpIX). The PpIX-weighted dose incident on the skin for a 2-hour treatment, considering attenuation by sunscreens, was determined. When compared to the unfiltered PpIX-weighted dose, it was shown that a reduction in dose of between 38% and 92% is possible. This work shows that careful consideration of sunscreen is important in optimising dPDT and may impact on the efficacy of this important treatment modality.

OP13 The influence of weather on daylight PDT in Scotland

Dr Iman Kotb¹, Mrs Andrea Cochrane¹, Dr Paul O'Mahoney², Dr Ewan Eadie¹, Professor Sally Ibbotson²

¹NHS Tayside, Dundee, United Kingdom, ²University of Dundee, Dundee, United Kingdom

Session A: PDT, Endeavour Room, May 9, 2019, 09:00 - 10:30

Biography:

Iman Kotb (MBBCh., MSc., PhD., MRCP (Dermatology)) is also a member of BAD and SDS. Iman is currently a UK specialty trainee and her research interest is immune mediated skin diseases.

Daylight photodynamic therapy (dPDT) is widely used in continental Europe and beyond as an effective and relatively painless treatment for diffuse field change actinic keratoses. Feedback from patients shows high levels of satisfaction and convenience. We have been using dPDT in the North of Scotland since 2013, and we were interested to see whether undertaking treatment in a particularly sunny summer would result in better outcomes. In 2016 and 2017, we treated a total of 48 patients and 73% had excellent to good responses. The treatment was well tolerated with median pain scores of 0.7-1.9. In 2018, Scotland had a particularly sunny summer and we treated 43 patients. Responses were comparable to those of 2016 and 2017, with 30% of patients treated achieving excellent response and 37% had a good response (total 67%). The median pain score was 0.7. Interestingly, the median PpIX-weighted exposure dose was similar for each of the three summers and ranged from 23-28 J/cm², which is significantly higher than the minimum recommended dose.

In summary, dPDT in Scotland is an efficacious and well-tolerated treatment for patients, most of whom had previously failed to respond to a range of other treatment options and had fairly advanced chronic field change photodamage and actinic keratoses. Thus, we have continued to show that dPDT is an effective and feasible therapy, irrespective of the nature of the summer weather.

OP14 Ultraviolet radiation exposure and effective daylight photodynamic therapy treatment times

Dr Luke McLellan¹, Dr Paul O'Mahoney^{1,2,3}, Dr Marina Khazova⁴, Dr Michael Higlett⁴, Prof Sally Ibbotson^{1,2,3}, Dr Ewan Eadie^{2,3}

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Session A: PDT, Endeavour Room, May 9, 2019, 09:00 - 10:30

Biography:

Currently in my first year of postdoctoral research investigating daylight photodynamic therapy with particular interest in patient radiation exposure and improving current dosimetry practices. Prior to this position, my Ph. D. studies were in hybrid nano-particle solution processed visible lasers with focus on colloidal quantum dots and organic semiconductors. Daylight photodynamic therapy (dPDT) is an effective treatment for actinic keratosis (AK). Thirty minutes following application of a topical photosensitiser prodrug, the patient is exposed to natural daylight radiation stimulating a photochemical reaction which removes the AK. During treatment patients are subjected to natural solar ultraviolet (UV) radiation and, as AK is the result of chronic UV exposure, it is important to limit this.

Historical illuminance, irradiance and erythema-weighted irradiance data, covering 12 locations in the UK and Europe between 2013 to 2017, were converted into protoporphyrin-IX (PpIX) weighted dose, UV-A exposure and erythema-effective dose assuming a 2-hour dPDT treatment. The data were averaged over each treatment period for each calendar month over the years. UV exposures were evaluated during viable dPDT periods, assuming a minimum PpIX-weighted threshold dose of 4 J/cm².

London experienced an average UV exposure of 7.6 standard erythema dose (SED) in July between 1100 and 1300 (UV-A dose 22.7 J/cm² and PpIX dose 22.2 J/cm²). A lower UV exposure, for the same location and month, of 1.5 SED is achieved later in the day (between 1600 and 1800, PpIX dose 9.5 J/cm²). In November, at the same location between 1200 and 1400, the average UV exposure was 0.7 SED with PpIX dose 6.0 J/cm².

This demonstrates that visible light levels remain high enough year-round for effective dPDT even during periods of relatively low UV exposure.

INV02 Utilisation of laser in endodontics

Prof. Stefano Benedicenti

University of Genoa

Session 2: Lasers in Dentistry (Oral surgery, implantology and endodontics), Discovery Room, May 9, 2019, 11:00 - 12:30

Biography:

Professor Benedicenti is an Associate Professor in Restorative Dentistry and Endodontics at the University of Genoa (Italy). He is Dean of the laser Centre at the University of Genoa, which is the pioneer in research and teaching laser therapy in Europe.

Professor Benedicenti is the Chair of the Department of Surgical Sciences and Integrated Diagnostics, University of Genoa/ Italy.

He is the President of the European Master Programme in Laser Science in Dentistry at University of Genoa and the President of the fellowship programmes in laser Dentistry at UCL-Eastman Dental Institute/ London/ UK.

He is the Founding Member of IAHT (International Academy of High Tech).

Professor Benedicenti is heavily involved in research, especially in the field of laser dentistry and photobiomodulation. He is an author and co-author of over 100 publications in the National and International peer reviewed journals and he is the author of three books in the field of laser dentistry and photobiomodulation in medicine and dentistry.

Utilisation of laser in endodontics

The use of lasers in dentistry has now become a part of our daily clinical practice. Rapid development of technology has led to enhance the instrumentation of the dental canals with a great improvement of the clinical outcome; teamed with the traditional methods. This is demonstrated in laser-based instrumentation, which add valuable benefits to primary dental treatment. Clinical skills and knowledge of advanced technologies such as; operating microscope, piezo-electric devices, and laser-assisted therapy are a progressive learning curve.

This presentation will provide the basis of the theoretical knowledge of laser photonics, together with current evidence-based practice in the use of laser in endodontics.

INV03 The use of laser in the management of oral and facial vascular lesions

Enrico Bernè

Magenta Medical Center, Institute for Study and Care of Vascular Anomalies, Milan, Italy

Session 2: Lasers in Dentistry (Oral surgery, implantology and endodontics), Discovery Room, May 9, 2019, 11:00 - 12:30

Biography:

Enrico Bernè M.D. teaches seminars and workshops for Development of Laser Technologies, he is a Professor at Department of Surgical Sciences and Radiodiagnostic integrated at Genoa University, Enrico's speciality is Laser Treatment of Vascular Anomalies. Enrico is a Medical and Scientific Chief in his-own Clinic at the Magenta Medical Center, Institute for Study and Care of Vascular Anomalies, Milan, Italy.

The use of laser in the management of oral and facial vascular lesions

Background and objectives

Vascular anomalies are featured by different clinical presentation and related with haemodynamic and histological patterns.

Laser technologies permit a selective approach with different wavelengths (but also with different devices) at vascular anomalies: only laser lights permit the selective destruction of anomalous vessels.

Material and method/Results

The interactions of Nd:YAG 1064 nm are well known on venular tissue, as are differences from "targeting" of a dye laser at 595 nm versus a 532 nm ip when we treat a port wine stain or tiny red telangiectasias.

The new approach is between these "old" wavelengths; the re-edition of 577 nm suggests a different application with a scanner device, that interpenetrates photothermolysis with thermal relaxation time for preservation of the soft tissue.

Last but not least is the role of a diode laser 980-1470 nm with optical fibres: this is the best approach with intralesional technique at low and mild-flow anomalies.

Conclusions

Author reports their work during thirty years of laser experience on 2500 patients with different vascular anomalies, from spider angioma to large venous angiodyplasias.

INV04 The use of laser in the field of implantology and peri-implantitis

Prof. Massimo Frosecchi

University of Genoa

Session 2: Lasers in Dentistry (Oral surgery, implantology and endodontics), Discovery Room, May 9, 2019, 11:00 - 12:30

Biography:

Professor Massimo Frosecchi's:

1992. Graduated in Dentistry and Dental Prosthesis at University of Florence, Italy.

1994 Post graduate course in "Implantology and pre-prosthetic surgery" at University of Florence, Italy.

1995 Course " Advanced Course in Implantology and Bone Graft Harvesting" at New York State University at Buffalo, USA.

2006-2007 Speaker at Post-graduate Course in Implantology at Universidade Guarulhos, Sao Paulo, Brazil.

2007, 2008, 2009, 2010, 2012, 2013, 2014, 2015, 2016 Speaker at Master Course of Fixed Prosthesis at University of Florence, Italy.

2008 Professor a c. at University degli Studi Gabriele D'Annunzio di Chieti Pescara, Italy.

Speaker in the same university in Master Course in Osseointegrated Implantology in 2007, 2008 and 2009.

2008-2009. Speaker in Master Course in Implantology at University of Pisa.

2008 Fellow of Italian section of ITI (International Team for Implantology), from 2005 international ITI speaker.

2008-2018 co-director of Implantology Courses at Universidade Nove de Julho, Sao Paulo, Brasile

2011. Study Club Director ITI for Toscana.

2011. Active member of International Piezosurgery Academy.
 2012-2014. Speaker at Master course in Piezosurgery at University Federico II, Napoli, Italy.
 2013 Speaker at Master Course in Microscopic Dentistry at University of Genoa, Italy.
 2013-2020 Professor a. c. in Implantology and Scientific evidences at University of Genoa, Italy.
 2013 Active member of AIOM (Italian Academy of Microscopic Dentistry)
 Private practice in Florence, Italy
 2016 Active member of Sio cmf (Società Italiana di Odontoiatria e Chirurgia Maxillo-faciale).
 2018 Coordinator of international master in Implantology and Prosthodontics Unige
 2018 active member of IAO (Italian academy of osseointegration)
 Implantology represents a very predictable treatment with high levels of survival and success. Despite this favourable aspect of the modality, complications are still occurring frequently. The biologic complications are quite common and complex.
 Many aspects in this field are still unclear and a periodontitis model is often used to understand the peri-implant disease, even if some of the factors remain peculiar.
 There is a lack of evidence-based literature regarding the decisional tree and the ideal treatments for periimplantitis. From the basis of scientific papers and clinical experience, has been proposed some clinical guidelines and procedures with specific tools.
 This presentation will provide an overview of the usefulness of lasers in implantology and peri-implantitis treatments, complemented with clinical cases.

INV05 The use of the Er:YAG in the management of snoring

Prof. Isabelle Fini Storchi, Prof. Stefano Benedicenti

University of Genoa

Session 2: Lasers in Dentistry (Oral surgery, implantology and endodontics), Discovery Room, May 9, 2019, 11:00 - 12:30

Biography:

Dr. Fini Storchi specialized in Otorhinolaryngology and Cervico-Facial Surgery in 1997 and in 2001 in Audiology. From 1999 to 2011 she worked as an ENT Specialist and Surgeon in the Otorhinolaryngology Clinic of the University of Florence. Since 2016 she is a visiting Professor in the University of Genoa.

Background: Snoring represents a real problem for many couples, hampering the quality of sleep of the bed partner. Furthermore, it can be a life-threatening problem. 15-45% of snoring is associated with Obstructive Sleep Apnea Syndrome (OSAS). Over some years, this can lead to an increase in the cardio-vascular, dismetabolic or cerebro-vascular diseases. The surgical therapy for snoring is almost always invasive, painful, and associated with a high morbidity. This presentation demonstrates a study of the University of Genova team on the use of Er:YAG in the management of snoring.

Aim: The study aim was to evaluate the non-invasive out-patient laser treatment of snoring in reducing or eliminating the loudness of snoring, choking, morning sleepiness and dry mouth in the morning.

Material and Methods: 40 snoring patients, 55% of which with OSAS that refused any other kind of treatments, were submitted to three Erbium:YAG Laser treatment sessions on the oropharynx.

Results: This treatment has shown to be effective in reducing significantly or ceasing of the loudness of snoring, reducing morning sleepiness, morning dry mouth and reducing waking up during sleep in a statistically significant way. Also, it was effective in eliminating choking in 91.6% of cases and in raising the incidence of dreaming in a statistically significant way. The results were stable at 20 months in 72% of cases.

Conclusions: Non-surgical and non-invasive Er:Yag laser treatments were effective in raising the quality of sleep and reducing the loudness of snoring and safe with no immediate or delayed.

INV10 Advances in Raman spectroscopy for rapid molecular identification of disease - Are we there yet?

Professor Nick Stone

Professor of Biomedical Imaging and Biosensin, University of Exeter

Session B: Photodiagnosics, Endeavour Room, May 9, 2019, 11:00 - 12:30

Biography:

Prof Nick Stone holds the position of Professor of Biomedical Imaging and Biosensing and NHS Consultant Clinical Scientist at the University of Exeter. Nick has worked to pioneer the field of novel optical diagnostics within the clinical environment, moving from the NHS after almost 20 years of working closely at the clinical/academic/commercial. He is an internationally recognised leader in biomedical applications of vibrational spectroscopy (Raman and IR).

In recent years, Raman spectroscopy has been shown to be a powerful tool in the analysis of biochemical changes associated with disease, particularly when coupled to chemometric analysis. Raman spectroscopy probes the inelastic scattering of light (and mid-IR absorption spectroscopy probes the absorption at longer wavelengths) by vibrational modes of bonds found in molecules. Both techniques are highly complementary to one another enabling the measurement of the measurement of analytes in body fluids, phenotypical changes in cells and disease specific tissue biochemistry. The elucidation of the origins of signals and the analysis of this data can provide significant insight into the pathogenesis of disease. Raman has shown particular value in the in vivo detection, identification, localisation and monitoring of various cancers and pre-cancers. In parallel with rapid developments in Raman, IR is also going from strength to strength with a number of approaches to providing discrete frequency imaging for high speed spectral histopathology. There is still much work to do before vibrational spectroscopies become routinely used in the clinic, but the evidence base is growing rapidly.

Here I will use specific clinical applications to illustrate the recent technological developments and any associated challenges for rapid spectroscopic analysis of disease will be discussed.

OP15 Performance of handheld light meter for measuring erythemally effective UVR output from sunbeds

Ms Isla Barnard¹, Mr Timothy Lush², Dr Ewan Eadie³, Professor Tom Brown¹, Dr Kenny Wood¹

¹School of Physics and Astronomy, University of St Andrews, St Andrews, KY16 9SS, United Kingdom, ²Glasgow City Council, City Chambers, Glasgow, G2 1DU, ³Photobiology Unit, NHS Tayside, Ninewells Hospital & Medical School, Dundee, DD1 9SY, UK

Session B: Photodiagnosics, Endeavour Room, May 9, 2019, 11:00 - 12:30

Biography:

Isla is a penultimate year PhD student at the University of St Andrews, studying UV radiation transfer through skin and sunscreen.

Highland Council has chosen to run a sunbed licensing scheme. The license is granted if the operator meets certain conditions, including compliance with the European safety standard set out for tanning equipment. The standard states that the total erythemally effective irradiance of a sunbed must be below 0.3 Wm; comprising of no more than 0.15 Wm⁻² ultraviolet A radiation (UVA) and no more than 0.15 Wm⁻² ultraviolet B radiation (UVB).

In 2012 Tierney et al. reported that 9 out of 10 sunbeds in England emit ultraviolet radiation (UVR) levels above the recommended European safety standard. With guidance from the Photobiology Unit at Ninewells Hospital, Highland council purchased a handheld detector for measuring the erythemally effective UVR irradiance of sunbeds (X14 light meter, Gigahertz Optik, Germany). A study was undertaken by the authors to test the performance of the handheld detector both in the laboratory and in the field. Results showed a maximum percentage difference of 23% between handheld detector and reference in the controlled

laboratory conditions. An average difference of 14% (\pm 6% st dev) was reported for field measurements.

In conclusion, the Gigahertz Optik X14 is a useful field instrument for measuring sunbeds with the purpose of investigating compliance with the European safety standard.

OP16 Enhancing experimental protoporphyrin IX-induced photodynamic therapy utilising a new combined iron chelating prodrug

Ms Charlotte Rebum¹, Ms Lizette Anayo¹, Dr Anette Magnussen¹, Dr Alexis Perry², Dr Mark Wood², **Prof Alison Curnow¹**

¹University of Exeter Medical School, Penryn, United Kingdom, ²University of Exeter, Exeter, United Kingdom

Session B: Photodiagnosics, Endeavour Room, May 9, 2019, 11:00 - 12:30

Biography:

Academic Director of Medicine for the University of Exeter Medical School. Experienced photodynamic therapy scientific researcher. Director (and Former Secretary General) of the International Photodynamic Association.

Background and Objectives: Administration of a separate iron chelator during protoporphyrin IX (PpIX)-photodynamic therapy (PDT) has been demonstrated to increase PpIX accumulation, resulting in increased efficacy on irradiation. This occurs because PpIX conversion to haem is iron dependent. A novel ester between aminolaevulinic acid (ALA) and the iron chelating agent CP94 has therefore been synthesised (AP2-18) and experimentally evaluated to determine if PpIX-induced PDT effectiveness could be improved by this new combined agent.

Materials and Methods: A variety of human primary cells of clinical relevance were aseptically cultured and the temporary accumulation of PpIX fluorescence measured following incubation with AP2-18 or ALA or its methyl ester (MAL)+/-CP94. Cell kill on irradiation (635 nm) was also assessed via the neutral red and lactate dehydrogenase assays.

Results: Iron chelation achieved via CP94 or AP2-18 administration consistently enhanced PpIX accumulation, but increased PpIX-PDT cytotoxicity was most pronounced when MAL or the lower doses of ALA were utilised (when PpIX was most limited). AP2-18 was observed to be as least as effective as CP94+ALA/MAL in all cell types investigated.

Conclusion: AP2-18 ensures simultaneous cellular delivery of an iron chelator and PpIX prodrug for maximum effectiveness, particularly in human skin cancer and glioma cells.

SS02 How laser treatment trends in the Plastic surgery and Laser centre have changed over the last decade

María Roxana Chiru¹

¹Bedford Hospital NHS Trust,

Session 3: Nursing and Therapist Session, Discovery Room, May 9, 2019, 14:15 - 15:40

Biography:

Mrs. Roxana Chiru is a plastic surgeon and on the Specialist Register with the GMC. She works at the Plastic Surgery and Laser Centre Bedford Hospital NHS Trust as a locum Consultant Plastic Surgeon. She has a PhD in oncoplast breast surgery and the BTEC Certificate in Medical Laser therapies

Laser treatments have had an impressive expansion over the last decade because of the technological progress and also due to the patients' increased confidence in these procedures.

Although the overall number of treatments has increased continuously, there have been different trends (ups and downs) for different pathologies. As we offer the whole range of treatment in our Laser Centre, we have analysed the trends over the years for each procedure and also the factors influencing these variations.

SS03 Preparation for anxious children undergoing laser therapy

Mrs Hilary Kennedy¹

¹Great Ormond Street Hospital London, London, United Kingdom

Session 3: Nursing and Therapist Session, Discovery Room, May 9, 2019, 14:15 - 15:40

Biography:

Hilary Kennedy (RSCN BSc (hons) Advanced BTEC laser) is a clinical nurse specialist in vascular anomalies and birthmarks at Great Ormond Street Hospital for Children. She has worked with the laser/birthmark unit since 2002 and is nurse advisor for the birthmark support group.

Background: The laser unit at Great Ormond Street Hospital was established 25 years ago. We treat a wide variety of conditions in children, including many types of vascular anomalies and our patients come from all over the UK and beyond.

Our laser team comprises of 5 Doctors, 2 Clinical Nurse Specialists and an experienced Health Care Assistant. We run 3 General anaesthetic lists and 3 local anaesthetic lists per week.

Aim: To describe our experience and the work that we undertake with our psychologists and play specialists, in preparing anxious children for laser treatments and to bring awareness of the importance of adequate preparation in our paediatric laser population.

Summary: During this talk, I will discuss the work that is carried out prior to laser treatments of children who need psychological support, to ensure that procedural anxiety is minimised. This involves visits to the clinical areas, showing the equipment used, including the laser glasses and making a wish list to ensure that procedural anxiety is minimised.

SS04 Combining Laser/IPL for Skin Rejuvenation

Mrs Rhiannon Smith¹

¹Lynton Lasers Ltd, Holmes Chapel, United Kingdom

Session 3: Nursing and Therapist Session, Discovery Room, May 9, 2019, 14:15 - 15:40

Biography:

Rhiannon is a Clinical Trainer at Lynton, UK manufacturers of Laser and Intense Pulsed Light systems. As well as equipment training, Rhiannon also teaches the Level 4 and 5 qualifications for laser and light therapy. Thanks to advanced medical aesthetic treatments and consumer demand to improve skin appearance, the skin rejuvenation market is expected to reach £2 billion by the year 2022. Non-surgical skin rejuvenation is more popular than ever with an ever-increasing market.

We are going to look at combining various technologies including laser, IPL, Radiofrequency and skin peels to achieve optimal results and to get the most out of your skin rejuvenation treatments.

SS05 The treatment of pre-cancerous skin lesions & skin cancers with laser therapy

Natalie Allen¹

¹Bedford Hospital NHS Trust,

Session 3: Nursing and Therapist Session, Discovery Room, May 9, 2019, 14:15 - 15:40

Biography:

Natalie is a Skin cancer / Laser Clinical Nurse Specialist at Bedford Hospital NHS Trust. Natalie qualified as a registered nurse at the University of Bedfordshire in 2005. She has since gained a BTEC Professional Certificate in Principles of Medical Laser & Light Therapies and Non-Surgical Procedures (2011) and a BSc in Healthcare Studies (2014).

As one of the named Clinical Nurse Specialists in the Trust she provides support to patients, carers and Health professionals as necessary in relation to skin cancer. Providing professional expertise, advice and care to those needing treatment and their families. She still runs regular Nurse led laser clinics and has an interest in laser treatment as an option when managing and treating pre-cancerous skin lesions and some skin cancers.

Patients presenting with pre-cancerous skin lesions and skin cancers continues to rise in the UK.

Standard treatments such as surgical excision including MOHS surgery, cryotherapy, curettage and cautery, topical and photodynamic therapies are usually the treatment modalities of choice. However, they are not without inherent morbidity, including risk of bleeding, infection and scarring.

Lasers may be an alternative treatment option for some of these lesions making them a promising treatment option for patients with multiple comorbidities and those who are unable to tolerate the favoured treatment methods

SS10: Advances in Er:YAG laser tissue regeneration with controlled thermal and non-thermal effects

Mario A.Trelles

Plastic-Aesthetic Surgeon, Spain & Dubai

Endeavour Room, May 9, 2019, 14:15 - 15:15

Biography:

MD and PhD Maxima Cum Laude, General Surgeon, Plastic Aesthetic and Reconstructive Surgeon. American Board Diploma for Lasers in Aesthetic Surgery

Professor and Chair of the Master Program "Lasers in Medicine & Surgery in Dermatology and Aesthetics for Post Graduated Doctors", College of Physicians, Barcelona Univ., Spain. Honor President of The European Society for Lasers in Aesthetic Surgery (ESLAS), President of the Spanish Laser Society (SELMQ) and the European Laser Association (ELA).

This study reports on the efficacy and safety of a novel method for tissue regeneration "Spatially Modulated Ablation" (SMA of the RecoSMA™ technology).

Various studies were performed:

i) In women with moderate to severe signs of facial aging, who underwent treatment -with a follow up to 12 months- with the RecoSMA™ technology (Linline™, Minsk, Belarus).

ii) Treatment of scar tissue in over 30 patients

iii) Treatment of derm-vascular chronic leg ulcers, non-reactive to any previous therapy used.

Clinical efficacy, tolerance, adverse effects, complications, and histological changes following treatment were evaluated. Photographs, biopsies and computer image analysis were used objectively to assess validity of the RecoSMA technology.

The mean improvement of overall different skin & vascular conditions treated was 74% (r=55% - 90%), and statistics showed significant efficacy of the various treatments conducted and outcomes achieved.

Patients, also those of dark skin photo-type, stated that they were satisfied or very satisfied and would recommend the treatment, which showed advantages over other methods for tissue condition improvement using lasers.

SS06 Current understanding and approach to the management of scars with laser therapy (Kindly sponsored by Candela)

Firas Al Niemi

Group Medical Director Sk:N Clinics London

Session 4: Skin Lasers, Discovery Room, May 9, 2019, 16:00 - 17:30

Biography:

Dr Firas Al-Niemi is a highly experienced consultant dermatologist, dermatologic surgeon and laser expert with over 15 years' experience and an international standing and trained in some of the UK's top hospitals and currently holds an honorary consultant position at the world-renowned St. John's Institute of Dermatology at Guy's and St. Thomas' Hospital where he completed an advanced fellowship in dermatologic surgery and skin cancers.

He has a passion for education, research and science & has over 150 publications in Dermatology and lasers making him one of the most

prolific and well-published consultant dermatologists in the UK. In addition to this he has more than 200 scientific presentations all around the world where he is regularly invited to speak.

He works at the renowned London Scar Clinic and has particular expertise and interest in the use of lasers in scar management.

Scars can cause a considerable physical and emotional distress to its sufferers and are broadly classified into atrophic, hypertrophic, and keloidal although several scar variants exist. The aetiology can include burns, trauma, surgery, acne, or any other insult to the skin.

Various treatment modalities exist for scars with lasers being increasingly used. Scar erythema has been shown to successfully be reduced by vascular lasers and atrophic scars improve with fractional ablative and non-ablative lasers. Combination therapy in association with laser-based therapies have been increasingly utilized in the management of scars.

This presentation will go through some of the common laser treatments per scar type with an algorithm of a choice based on current evidence.

OP04 Results of the diode laser 805nm application among groups of various ethnicities- cohort study results

Ms Magdalena Atta-Motte¹, Ms Izabela Zaleska²

¹5th Avenue Medical Clinic, London, United Kingdom, ²The Section of Professional Cosmetology, The Faculty of Motor Rehabilitation, University of Physical Education in Krakow, Krakow, Poland

Session 4: Skin Lasers, Discovery Room, May 9, 2019, 16:00 - 17:30

Biography:

Magdalena Atta-Motte has from MSc in Public Health from Jagiellonian University of Cracow in 2004. In meantime graduated from European School of Cosmetology in Cracow in 2003. LPA and accredited trainer and lecturer for various Academies and Universities. Fellow of RSPH, Member of BMLA, SCS. Author of various scientific publications.

According to the scientific publications, laser epilation has been repeatedly described as the most effective method of hair reduction. So far, no attempt has been made to elaborate skin reactions including side effects and its effectiveness in patients of various ethnicity.

The aim of the study is to show the objective effectiveness and its side effects of diode (805nm) laser hair removal in pubic area in groups of various ethnicities. Side effects are an inevitable part of laser therapy its management is crucial to ensure patients safety. This study analyses the occurrence of side effects in a group of various ethnicities alongside its effectiveness.

The study was conducted in UK and Poland on the group of 216, 20- 40 years old patients qualified for the course of 6 treatments after the initial interview and patch test. Ethnicity was defined by questionnaire in accordance with Census 2001. Participants were divided into the 4 groups: white skin participants, black skin participants, Asian skin participants mixed race participants.

Effectiveness was analysed in the area of 1 cm² of the treated skin, as the percentage of the hair reduction. Objective effectiveness analysis in groups shows an excellent result of the hair removal therapy: 92.5% for Asians, 81.5% for participants with black skin, 86.9% for mixed raced participants and 88.2% for white skin participants.

Side effects were correlated with ethnicity (p = 0.001). The highest percentage of complications occurred in the group of black skin 81.82% and mixed race 81.25% participants. No adverse effects were observed.

OP05 Epilation results comparison: diode laser versus IPL. The effectiveness of diode laser epilation following IPL.

Dr Izabela Zaleska¹, Magdalena Atta-Motte

¹University Of Physical Education, Krakow, Poland, Krakow, Poland

Session 4: Skin Lasers, Discovery Room, May 9, 2019, 16:00 - 17:30

Biography:

Izabela Zaleska – an international expert in the field of Cosmetology,

specialist in the field of Aesthetic, Medical and Therapeutic

Cosmetology. She graduated from the Medical University of Lodz, PhD obtained at the Faculty of Medicine at the Jagiellonian University of Cracow. Author of over 30 scientific publications.

Lasers and IPL action is similarly based on the selective photothermolysis principle, where melanin acts as chromophore. There are, however, fundamental differences in the way they're built and in the light they emit. Laser (Light Amplification by Stimulated Emission of Radiation) emits monochromatic light, with little discrepancy, coherent over time and distance and with significant power density.

IPL (Intense Pulse Light) on the other hand emits intense, pulsing, polychromatic light which is non-parallel and has no fixed wavelength.

Epilation has been the subject of numerous scientific papers, mostly comparing various kinds of lasers while none has defined the relation between coherent and non-coherent light.

The goal of this paper is to compare the results of epilation treatments by laser and by IPL and to rate the effectiveness of diode laser epilation following non-coherent light therapy.

The results do not surprise. A percentage average of hair loss among patients treated with diode laser is higher which indicates laser's higher effectiveness. IPL has been shown to negatively impact the effectiveness of diode laser. This is linked with the way non-coherent light weakens and thins the hair which impedes the absorption of laser light by melanin and adversely affects treatment results.

OP06 308nm excimer laser in targeted dermatological conditions – 15 years' experience

Dr Zambia Kader¹

¹London Laser, United Kingdom

Session 4: Skin Lasers, Discovery Room, May 9, 2019, 16:00 - 17:30

Biography:

Dr Kader is Nuclear Medicine trained Consultant with a special interest in laser technology. She has a Fellowship in aesthetic medicine and is also a certified laser protection advisor (ALSP). She is an author and tutor for cosmetic medicine for the university of south wales.

The 308-nm excimer laser has been approved by the Food and Drug Administration for the management of targeted dermatological conditions with inflammation and hypopigmentation.

OBJECTIVE:

To review the treatment outcomes of the 308-nm excimer laser (Photomedex) in treating vitiligo, psoriasis and atopic dermatitis in an adult population.

VITILIGO: 103 patients with chronic stable vitiligo, refractory to conventional treatments were treated twice a week in conjunction with a daily application of tacrolimus 0.01% to the affected areas. Repigmentation was noted in more than 40% of the patients, with 75% of the success cases noted on the face, 66% on the limbs and 51% on the trunk.

PSORIASIS: 48 patients were treated twice a week for 16 weeks and the Psoriasis Severity Index (PSI) was measured every 2 weeks. PSI improvement was 68% at 6 weeks and 72% at 12 weeks.

ATOPIC DERMATITIS: 27 patients (with less than 25% body area involvement) were treated twice a week. The severity was assessed via a clinical scoring of the erythema and pruritus. After 6 weeks of treatment the clinical scoring was significantly lower than the initial values.

OUTCOME: Excimer lasers are highly effective in the treatment of atopic dermatitis, psoriasis and Vitiligo (when combined with topical tacrolimus therapy). Targeted photo therapy is a safe, trouble-free management option with valuable outcomes. All patients saw an improvement in their quality of life and a decrease in their symptoms.

INV11 The current concept of LLLT (Photobiomodulation) (Genoa Flat-top profile versus Gaussian profile) and the way forward

Prof. Stefano Benedicenti

University of Genoa

Session C: Low Level Lasers (LLLT) and LEDs in Medicine and Dentistry, Endeavour Room, May 9, 2019, 16:00 - 17:30

Biography:

Professor Benedicenti is an Associate Professor in Restorative Dentistry and Endodontics at the University of Genoa (Italy). He is Dean of the laser Centre at the University of Genoa, which is the pioneer in research and teaching laser therapy in Europe.

Professor Benedicenti is the Chair of the Department of Surgical Sciences and Integrated Diagnostics, University of Genoa/ Italy.

He is the President of the European Master Programme in Laser Science in Dentistry at University of Genoa and the President of the fellowship programmes in laser Dentistry at UCL-Eastman Dental Institute/ London/ UK.

He is the Founding Member of IAHT (International Academy of High Tech).

Professor Benedicenti is heavily involved in research, especially in the field of laser dentistry and photobiomodulation. He is an author and co-author of over 100 publications in the National and International peer reviewed journals and he is the author of three books in the field of laser dentistry and photobiomodulation in medicine and dentistry.

The current concept of Photobiomodulation (Genoa Flat-top profile) and the way forward

Photobiomodulation (PBM) has been used in clinical practice for more than 40 years and its action mechanisms on cellular and molecular levels have been studied for about 30 years. In clinical applications, photobiomodulation has been used to successfully induce wound and bone healing, pain reduction and anti-inflammatory effects. Significant effort has been made to clarify parameters of deposited energy density that will effectively promote positive change in individual cells while avoiding negative effects. While the bio-stimulatory effect of laser energy is experienced on a cellular level, the energy is applied macroscopically to large volumes of tissue in a non-uniform manner. As energy passes through tissue, part of it is absorbed so each successive depth of cells is irradiated differently. Beer's law is usually used to define this relationship. However, this is inadequate since the dominant form of interaction at wavelengths between 600 nm and 1400 nm is scattering. Thus, as energy enters tissue, its density decreases rapidly.

The presentation would provide the current in-vitro and in-vivo researches on a new flat-top handpiece for biomodulation and its usefulness in medical and dental applications.

INV12 Photobiomodulation in bone regeneration

Dr Reem Hanna

Associate Specialist in Oral Surgery King's College Hospital NHS Foundation Trust

Session C: Low Level Lasers (LLLT) and LEDs in Medicine and Dentistry, Endeavour Room, May 9, 2019, 16:00 - 17:30

Biography:

Dr. Reem Hanna BDS, MSc Oral Surgery (UCL/London), MSc laser dentistry (UNIGE), PGDipSed (KCL/London) PGCAP (KCL/London), PGDipAC (KCL/London) FAHE.

Associate Specialist in Oral Surgery, King's College Hospital NHS Foundation Trust.

Registered Specialist Oral Surgeon in UK.

Honorary Senior Lecturer at UCL/ Eastman Dental Institute/ London/UK Professor a.c., at the Department of Surgical Sciences and Integrated Diagnostics, University of Genoa, Italy.

Course leader of the fellowship courses in laser dentistry. UCL/Eastman Dental Institute.

Currently perusing her doctorate degree in photomedicine.

Dr. Hanna is heavily involved in research especially in utilising laser therapy in neuropathic pain, tissue regeneration and repair and surgery. She has published many papers in this field in peer-reviewed journals.

Introduction

Photobiomodulation is a clinically accepted tool in regenerative medicine and dentistry to improve tissue healing and repair. The current in vitro study aimed to investigate the 980 nm photobiomodulatory effects on the

MC3T3-E1 pre-osteoblast, delivered with flattop (FT) profile in comparison to the Gaussian-standard (ST) profile.

Materials and methods

The MC3T3-E1 pre-osteoblasts were irradiated at a power of ~0.9 W (measured with power meter) in a continuous emission mode for 60 seconds. The delivery systems were the flattop versus the standard profiles. The laser groupings and their associated energies were as follows: Group 1: once per week, Group 2: three times per week, Group 3: five times per week. The treatment duration was 2 weeks. The metabolic activity and the osteoblast maturation were analysed by alkaline phosphatase (ALP) assay, alizarin red S histological staining, immunoblot and/or double immunolabeling analysis for Bcl2, Bax, Runx-2, Osx, Dlx5, osteocalcin, and collagen Type 1.

Results

Our results showed a statistically significant increase (* $p < 0.05$) of cell viability and Osx protein presence, when they were irradiated with the FT hand-piece in groups 1 & 3. ALP colonies formation and matrix mineralization improved with the FT hand-piece ($p < 0.05$) in groups 1 & 2. Immunocytochemical data showed that both the OC and the Col 1a1 were statically significant ($p < 0.05$) in groups 1 & 2 when the cells irradiated with FT hand-piece and the increase was more consistent ($p < 0.05$) respect to the ST hand-piece irradiation.

Conclusion

Our data, for the first time, prove that laser irradiation of 980 nm wavelength with flattop beam profile delivery system, compared to Gaussian profile, has improved photobiomodulatory efficacy on pre-osteoblastic cells differentiation. Mechanistically, the irradiation enhances the pre-osteoblast differentiation through activation of Wnt signaling and activation of Smads 2/3- β -catenin pathway.

OP17 Effects of low-level laser therapy on grades II and III of diabetic foot ulcers

Dr Mitra Hajizadeh¹

¹Merit, 592 Finchley Road, London Nw11 7rx, United Kingdom, ²Milad Hospital, Tehran, Iran

Session C: Low Level Lasers (LLLT) and LEDs in Medicine and Dentistry, Endeavour Room, May 9, 2019, 16:00 - 17:30

Biography:

- Manager at Merit wellbeing center (London)
- Specialist physician in internal medicine Tehran University (Iran) 1990
- Graduated in Master of Healthcare Administration from Walden University, USA in 2018
- Laser Therapist & Member of Europe WALT Society
- Member of British Medical Laser Association

Objective: To evaluate the effect of Low-Level laser Therapy on foot ulcers in diabetic type II based on photographic assessment.

Background data: Researchers have been used low level lasers to enhance wound healing. Ulcers in diabetic patients are in risk of compromised healing, due to reduced microcirculation and the other disorders that may affect wound healing.

Material and Methods: Thirty diabetic type 2 patients, with grade II and III diabetic foot ulcers were treated by low level laser therapy. The mean duration of diabetes was 14.3 years and ulcers were present since average 3.4 months ago. Treatment sessions were performed every other day for 10-15 sessions and then continued two times a week until complete healing or achieving grade 1.

Results: Mean of wounds surface was 43.5 cm² (range 0.09- 62.5) before treatment and was 0.3 cm² (range 0- 1.7) after about 18 treatment sessions (range 8-46), $p < 0.001$.

There was no relapse or other problem with ulcers during three months of follow-up. There were no reported side-effects by the patients.

Conclusion: Low level laser therapy could be a safe and effective method for treatment of diabetic foot ulcers. Clinical trials with higher sample size are proposed to evaluate more details about low level laser therapy effectiveness on diabetic wound healing process.

Researchers:

Dr. Mitra Hajizadeh

Dr. Nooshafarin kazemi khoo

Dr. Fataneh Hashem Dabaghian

INV13 An Update on APDT in Dentistry

Professor Mark Wainwright¹

¹Liverpool John Moores University, Liverpool, United Kingdom

Session C: Low Level Lasers (LLLT) and LEDs in Medicine and Dentistry, Endeavour Room, May 9, 2019, 16:00 - 17:30

Biography:

Prof. Mark Wainwright has been in photosensitiser R&D since 1987, initially in the photodynamic therapy of cancer, but for over 25 years in infection control applications, especially concerning conventional drug resistance. He formed the spin-out drug-discovery company Pharamlucia in 2008. His book *Photosensitisers in Biomedicine* was published in 2009.

The application of photosensitisers to oral infection was at the forefront of the renaissance in antimicrobial photodynamic therapy (APDT) in the early 1990s and, with blood product disinfection, remains the major area of clinically-realised activity.

The oral cavity represents a relatively simple collection of presentations in terms of photosensitiser and light administration and the use of APDT for example in periodontitis and endodontics is established globally, but to varying degrees, probably due to the lack of standard protocols.

APDT is a truly antimicrobial approach, the reactive oxygen species generated during illumination being sufficient to kill or inactivate Gram+/- bacteria, fungi or viruses, if a cationic photosensitiser, such as methylene blue or toluidine blue, is used. In addition, the killing effect is rapid compared with conventional antimicrobials or biocides, and the use of APDT is, by definition, non-antibiotic and so conserves that valuable resource. Furthermore, the use of photosensitisers which are chemically dissimilar to any class of conventional antimicrobials means that conventional resistance is not encouraged, while resistance to the photosensitisers themselves is unlikely due to the multiplicity of sites of action offered by reactive oxygen species. APDT is indicated in endodontics, periodontitis, debridement, peri-implantitis and root/furcation disinfection.

INV14 Antimicrobial photodynamic therapy as an adjunctive tool for the surgical management of chronic periodontitis

Dr Snehal Dalvi²

¹University of Genoa, Genoa, Italy, ²SDKS Dental College and Hospital, Nagpur, India

Session C: Low Level Lasers (LLLT) and LEDs in Medicine and Dentistry, Endeavour Room, May 9, 2019, 16:00 - 17:30

Biography:

Snehal has completed her BDS and MDS in Periodontology from Maharashtra University of Health Sciences, India. She has obtained Fellowship in Laser Dentistry from University of Genoa, Italy conducted at UCL Eastman Dental Institute, London. At present, she is pursuing her MSc in Laser Dentistry at University of Genoa, Italy.

Background: Antimicrobial photodynamic therapy (aPDT) has proved to be an effective adjunctive modality with potential benefits in the management of chronic periodontitis. The combination of photothermal and photodynamic effects of Indocyanine green (ICG) dye, when it is photoactivated with a diode laser of 810 nm wavelength, has been well documented in literature.

Aim: This study was conducted to evaluate whether a single session of antimicrobial photodynamic therapy using ICG dye-810 nm diode laser combination can provide a substantial benefit when it is utilised as an adjunct to open flap debridement (OFD) in the management of chronic periodontitis.

Materials and Method: Following thorough scaling and root planing, a comparative split mouth randomised controlled clinical trial was carried out on 20 recruited subjects who provided one test (OFD + aPDT) and one control site (OFD alone) each (total 40 treatment sites). The test group was subjected to a single episode of aPDT using ICG photosensitiser dye (1 mg/ml) activated with 810 nm diode laser. Clinical parameters were assessed at baseline and 3 months.

Results: Intragroup comparison using paired t-test revealed a statistically significant improvement from baseline visit. Intergroup comparison using independent samples t-test showed a statistically significant improvement in clinical parameters of the test group.

Conclusion: Utilisation of ICG dye activated with 810 nm diode laser, which mediated aPDT, has demonstrated surplus clinical improvement following OFD in the management of chronic periodontitis.

INV07 Side effects of lasers in the paediatric population and safety in the paediatric laser room

Karolina Gholam Paediatric Dermatology Consultant, Great Ormond Street Hospital

Session 5: Adult and Paediatric Dermatology, Discovery Room, May 10, 2019, 08:15 - 09:30

Biography:

Dr Karolina Gholam is currently working as a Paediatric Dermatology Consultant at Great Ormond Street Hospital and as an Honorary Lecturer at the Institute of Child Health. She is one of only three doctors dually accredited in Paediatrics and Dermatology in the United Kingdom. She obtained a master's degree in Clinical Paediatrics and her thesis on Familial Haemophagocytic Histiocytosis was published in the journal *Clinical and Experimental Immunology*. She completed the Paediatric Educators Programme and lectures regularly on paediatric dermatology related topics. She has published on the use of propranolol for infantile haemangiomas and other paediatric dermatology conditions. She has a special interest in eczema and psoriasis, adolescent dermatology especially acne as well as birthmarks and vascular anomalies.

Great Ormond Street Hospital for children is a centre for laser treatment of vascular anomalies; we have four lists under local anaesthetic and three under general anaesthesia every week, run by paediatric dermatologists with nursing support from clinical nurse specialists and health care assistants.

On average we have 1400 procedures a year treating at least 400 children during this period. Although capillary malformations like port wine stains and resolved haemangiomas are the common conditions, there is a variety of another twenty skin conditions we treat.

Our low complication rates are due to highly trained staff performing and assisting with the laser treatments and effective maintenance of our equipment. We have a dedicated laser room in main theatres with V Beam Pulse Dye and Cynergy Multiplex Lasers.

Patients are consented, depending on the procedure, for pain, swelling, blistering and potential scarring, pigmentary changes, hair loss and need for further treatment.

Throughout the procedures we adhere to checklists, standard ones set by the WHO for theatres as well as laser specific. In case a complication arises, patients are able to contact the department promptly and advice is given to optimise the outcome.

All complications and side effects are discussed at our monthly laser meetings to ensure they were dealt with efficiently and establish how they can be avoided in the future.

SS07 Nd:YAG laser treatment for hirsutism in children

Samira Batul Syed¹, Chaldaipoulou Soutana¹, Giulia Rinaldi¹

¹Great Ormond Street Hospital NHS Foundation Trust for Children, London,

Session 5: Adult and Paediatric Dermatology, Discovery Room, May 10, 2019, 08:15 - 09:30

Biography:

Chaldaipoulou Soutana is a sixth-year medical student at University of Ioannina, in Greece. She is interested in Dermatology and has done her observership at Great Ormond Street Hospital for Children. Soutana is also a leading member of Scientific Congress of Hellenic Medical Students. Dr Samira Batul Syed is presenting this abstract on her behalf at the conference.

Background: Hirsutism is excessive hair growth in androgen-dependent areas; in a typical male distribution pattern. It is a common clinical problem in children caused by several medical conditions such as Polycystic Ovarian Syndrome or conditions that disrupt normal hormone levels, e.g. congenital adrenal hyperplasia. Family history and ethnicity play a significant role in the pathogenesis of hirsutism. Untreated hirsutism causes considerable loss of self-esteem and psychological morbidity. Laser hair removal in children is less well established (1).

Objective: The aim of this audit was to evaluate the efficacy of Nd:YAG laser for the treatment of hirsutism in children.

Patients and Methods: 17 children aged 4-15 years (14 F: 3 M) were identified as receiving treatment using Nd:YAG laser. Photos of patients before and after as well as their clinical records were reviewed. We used our standardised grading system as well as the Ferriman-Gallway score (2). Pulse duration, 30-40ms, fluences 15-70 (J/cm²) and spot size of 10 mm was used. Ice cool water, cryo4 air flow, were used during treatment. Five patients had general anaesthesia while twelve were treated under local anaesthesia.

Results: In 8 patients, there was marked clinical improvement as hair became thinner, lighter in colour and reduced in amount. 2 patients showed no improvement. 7 remaining patients will be incorporated once the outcomes of their assessments are known. We plan to present our results using the Ferriman-Gallway scoring system for all our patients.

Conclusions: Nd:YAG laser is a useful tool for the treatment of hirsutism in children

References

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2. Bulent O. Yildiz, Sheila Bolour, Keslie Woods, April Moore, Ricardo Azziz. Visually scoring hirsutism. *Oxford Journals, Human Reproduction Update.* 2010 Jan-Feb; 16(1): 51-64

SS08 Cutaneous Lymphatic Malformations Treated with the Multiplex Laser

Samira Batul Syed¹, Mona Ashour¹

¹Great Ormond Street Hospital NHS Foundation Trust for Children, London, Session 5: Adult and Paediatric Dermatology, Discovery Room, May 10, 2019, 08:15 - 09:30

Biography:

Associate Specialist in Paediatrics (Dermatology)/Consultant in the department of Dermatology at the Royal Free Hospital NHS Trust. MBBS, DCH, DCCCH RCPEd RCGP FCM, BTEC Adv LASER, DPD

• Special interest in Vascular Anomalies in Children. Trained at UCHMS in London. Having completed house jobs at UCH and Barnsley hospitals, gained ten years of experience in paediatrics, neonatal medicine and community child health within the UK and abroad.

• Working at GOSH in London in Paediatric Dermatology for the last twenty-five years. Three years ago, joined the paediatric dermatology department at the Royal Free Hospital's outreach paediatric dermatology clinics as a locum consultant.

• Experienced in using lasers for the treatment of vascular birthmarks and vascular anomalies

• Part of the MDT who look after difficult and challenging patients with rare and complex vascular anomalies at GOSH.

• *Research interest is in the development of new therapies for vascular anomalies, including novel drugs and new concepts in laser therapies.*

Background: Lymphatic malformations (LMs) are common cutaneous/deep lesions comprising of micro, macro or mixed cystic lesions. They can be localised, generalised with multiple blebs. Skin, mucosa and other tissues of the body can be involved. Rarely, complex anomalies can be associated with LMs. Most are present during infancy. Current options of treatment include sclerotherapy/ surgery/ laser therapy.

Objective: To assess the efficacy of Multiplex Laser for the treatment of cutaneous LMs.

Study design/Material and methods: A retrospective analysis of clinical outcomes was evaluated on a cohort of 20 patients. Information was obtained from our laser records and hospital electronic clinical notes. All patients had photos before and after treatment. The outcome was graded using a newly devised severity scoring with scores 1 to 4. The colour, flattening, shrinkage and pre and post laser complications were evaluated. The hospital notes were sought for clinician's assessment and parental comments on the outcome.

Results: 20 patients (9M:11F) with mean number of laser sessions of 3.7 /patient, with an average of 90 pulses/session was noted, age range was between 16 months to 16 years with an average age of 8.8 years at 1st treatment. The average age at last laser treatment was 10 years. Data analysed confirmed the percentage improvement being statistically significant (p value <0.05) for all 7 parameters with the greatest improvement for reduction in bleeding.

Conclusion: There was a reduction in the LM severity scores using this method of treatment. The complex anomaly patients with an LM required higher number of procedures and necessitated general anaesthesia.

OP07 Idiopathic guttate hypomelanosis treated with 308nm excimer light and topical bimatoprost- a case report.

Dr Firas Kreeshan¹, Dr Vishal Madan^{1,2}

¹Laser Division, Department of Dermatology, Salford Royal NHS Foundation Trust, Salford, M6 8HD, United Kingdom, ²Everything Skin Clinic, Haw Bank House, Cheadle, Salford, SK8 1AL, United Kingdom
Session 5: Adult and Paediatric Dermatology, Discovery Room, May 10, 2019, 08:15 - 09:30

Biography:

Firas Kreeshan

Speciality registrar in dermatology at Salford Royal Hospital NHS Foundation Trust.

Background:

Idiopathic guttate hypomelanosis (IGH) is an acquired pigmentary disorder characterised by the presence of multiple small round hypopigmented macules on the shins and forearms. Although asymptomatic, it can cause considerable cosmetic anxiety. The pathogenesis is not fully understood but a combination of genetic and environmental factors in particular, chronic sun exposure has been incriminated. To date, there have been no universally effective treatments.

Methods:

A 48-year-old female presented with an 8-year history of multiple depigmented macules on both legs, typical of idiopathic guttate hypomelanosis. She had skin phototype 4 and a positive family history of IGH. She had previously tried topical pimecrolimus without any discernible improvement. She received targeted phototherapy with excimer lamp (308 nm, 250- 480 J) and a small patch was treated with once daily topical bimatoprost in addition to excimer lamp. After 5 sessions, better improvement was noted on the combination treatment patch, she received combination treatments for further 6 sessions.

Results:

Good repigmentation has been achieved on the smaller macules. The larger depigmented macules continue to improve with further treatments.

Conclusion:

Combination excimer laser with topical bimatoprost appears to be a promising potential treatment option for IGH, a condition where management options are otherwise limited.

OP18 Laser tattoo removal – a deeper analysis of the various processes.

Michael Murphy¹

¹DermaLase Training Services, Glasgow, United Kingdom

Session D: Basic Science and Safety, Endeavour Room, May 10, 2019, 08:15 - 09:30

Biography:

Mike Murphy has spent over 30 years in the medical laser industry - in clinical research, product development, international sales and marketing and training. He continues to research deeper aspects of laser-tissue interactions specializing in the physics of those interactions.

Treating tattoos with high-powered lasers has been the norm since the mid-1980s. However, there is still a lack of understanding of the basic processes involved. Recent theoretical analysis of carbon black ink shows that there are a number of important temperature-dependent processes which occur at different stages. These include the explosive boiling of tissue water, the carbon-steam reaction, rapid thermal expansion of hot ink absorbers, photospallation, cavitation bubble formation leading to a resonating photoacoustic response with acoustic interference patterns, and the sublimation of the carbon particles (with also a possibility of sonoluminescence).

We examine the processes which occur during the temperature-timeline which occurs during a laser tattoo treatment. The likelihood of plasma-formation will also be discussed.

It is very possible that current clinical protocols may be improved with a better understanding of these processes for this treatment.

OP19 Numerical model of laser tissue ablation and thermal injury

Mr Lewis Mcmillan¹, Dr Paul O'Mahoney^{2,3,4}, Mr Kairui Feng⁵, Dr Chunhui Li⁵, Dr Kenny Wood¹, Dr Ewan Eadie^{3,4}, Prof Tom Brown¹

¹SUPA, School of Physics and Astronomy, University of St Andrews, St Andrews, KY16 9SS, Fife, United Kingdom, ²School of Medicine, University of Dundee, Dundee, DD1 9SY, UK, ³Photobiology Unit, NHS Tayside, Dundee, DD1 9SY, UK, ⁴The Scottish Photodynamic Therapy Centre, Dundee, DD1 9SY, UK, ⁵School of Science and Engineering, University of Dundee, Dundee, DD1 4HN, UK

Session D: Basic Science and Safety, Endeavour Room, May 10, 2019, 08:15 - 09:30

Biography:

Lewis McMillan is a final year physics PhD student at St Andrews University. His research interests are in using Monte Carlo radiation transport method for various applications within medicine and biophotonics.

Ablative lasers are used in a wide variety of medical and aesthetic procedures including treatment of acne scarring and Rhinophyma, coagulating scalpels, and skin rejuvenation.

Laser ablation has also been recently investigated as a way of better drug penetration into the skin for various therapies such as photodynamic therapy (PDT). This is achieved by “drilling” holes in the skin allowing better drug diffusion.

We have created a numerical model of tissue ablation. This model couples together three numerical methods: Monte Carlo radiation transport (MCRT), finite difference method (FDM), and a tissue damage model.

The MCRT method involves simulating the propagation of photons through a medium using interaction probabilities to follow their paths and can determine physical properties such as the energy absorbed, and light scattered.

FDM is a numerical method for calculating heat diffusion, by numerically approximating the heat equation.

Our tissue damage model uses the Arrhenius damage model to predict thermal damage in the areas surrounding ablative craters.

The developed model allows us to investigate ablation crater depth as a function of laser power, and thermal injuries around the ablative crater. We validate our results against theoretical expressions and experiments on porcine skin.

Our results show that the thermal injury zone extends out to approximately 0.23 mm around the ablation crater.

It is hoped this computational model could be used to predict the depth of the ablative crater when using a given laser power for various different applications such as: laser assisted drug delivery, and various cosmetic applications.

OP20 Longer pulsewidths are clinically better when treating hair/blood vessels with laser/IPL systems

Michael Murphy¹

¹DermaLase Training Services, Glasgow, United Kingdom

Session D: Basic Science and Safety, Endeavour Room, May 10, 2019, 08:15 - 09:30

Biography:

Mike Murphy has spent over 30 years in the medical laser industry - in clinical research, product development, international sales and marketing and training. He continues to research deeper aspects of laser-tissue interactions specializing in the physics of those interactions.

It is generally believed that 'short pulsewidths are good for thin targets, and long pulsewidths are better for thicker targets. While this might appear to be intuitive, it is incorrect. A simple thermodynamic analysis coupled with the Arrhenius Damage Integral approach to protein denaturation reveals that 'short' pulsewidths may not achieve the desired result in many targets. A successful destruction of unwanted tissue requires at least two stages – applying heat to raise the local temperature to the required levels, followed by a sustained denaturation of the tissue proteins. Selective photothermolysis deals with the first of these aims, while completely ignoring the second. Many treatments fail to achieve their goal simply because the targets are not heated for a sufficiently long period.

To achieve consistently good clinical results, a better understanding of these processes is required, particularly the timings aspects, which are generally poorly understood.

This talk will demonstrate the mathematical/physical reasons why longer pulsewidths should always be considered for many skin targets.

OP21 Safety measures to reduce the risks of laser-generated biologic air contaminants

Dr Zambia Kader¹, Dr Shafiah Muna Binti Abdul Gafoor²

¹London Laser, United Kingdom, ²University of South Wales,

Session D: Basic Science and Safety, Endeavour Room, May 10, 2019, 08:15 - 09:30

Biography:

Dr Kader is a Nuclear Medicine trained consultant with a special interest in Laser Technology. She has a fellowship in aesthetic medicine and is also a certified laser protection advisor (ALSP). She is an author and tutor for cosmetic medicine for the university of south wales.

Laser safety management is principally influenced by Laser Beam Hazards and Non-Beam Hazards (NBH). Surprisingly, non-beam-related hazards are far more dangerous than the laser beam itself. The most common NBH include electrical factors, compressed gases, dyes and solvents, x-ray radiation, radio-frequency radiation, plasma radiation, ergonomics, noise contaminants and air contaminants. Laser-generated air contaminants are often neglected, and laser operators fail to abide by strict personal safety protocols. A plume of contaminants is often created during laser-target tissue interaction. These biologic nanoparticles are often less than 0.1 micrometres and can therefore travel with ease to the deepest parts of the lung and other locations in the human body.

Interestingly, a study conducted by Hill et al. (2012) concluded that the ablation of one gram of tissue produces a smoke plume with an equivalent mutagenicity to six unfiltered cigarettes. Unfortunately, the potential problem with these lasers induced nanoparticles is the complexity of assessing worker exposure and possible subsequent health effects. At present, there are minimal occupational standards regarding laser generated biologic air contaminants. It is essential to evaluate the safety measures and controls required for specific operations and treatments. Although a respirator, or air-purifying device can be beneficial in filtering out these biological hazards, improvements in engineering controls must be sought to reduce the risk of contaminant transmission at the source. Laser operators should be highly educated and trained by qualified laser safety specialists such as laser protection advisors, and the operational procedure protocols should be guided by expert laser healthcare professionals.

INV15 The true history of Penicillin

Dr Eric Sidebottom

University of Oxford

The Vasant Oswal Orator, Discovery Room, May 10, 2019, 09:45 - 10:30

Biography:

Dr Sidebottom read Medicine at Oxford and Barts 1957-63 and then worked for a DPhil under (Sir) Henry Harris in the Sir William Dunn School of Pathology in Oxford. Appointed to a University Lecturership in Experimental Pathology and a Fellowship (as medical tutor) at Lincoln College.

Left these posts in 1989 to become Assistant Director of Clinical Research at the Imperial Cancer Research Fund. In 1994, returned to teach in Oxford and study and write about Oxford's Medical History, especially the true story of the development of penicillin which is the subject of my Lecture to BMLA.

The world associates the name Alexander Fleming with penicillin and though Fleming did discover the antibacterial properties of the penicillium mould (and introduce the name penicillin) he played no part in developing the antibiotic treatment that revolutionised the treatment of infectious diseases and saved millions of lives. That work was done entirely in Oxford by the team led by Howard Florey, including Ernst Chain, Norman Heatley and Edward Abraham. There are, in fact, 10 names on the two publications first describing the work, and on the memorials commemorating it.

In the lecture I shall first describe the destruction wrought by infectious disease in the 19th C, and then how the work first by Fleming in St Mary's hospital and then by Florey's team in Oxford changed that. The story combines the interplay of the most unlikely combinations of rare events with extraordinary dedication to work and the ingenious application of new and so far, untested scientific techniques.

It illustrates clearly how different people work as individuals and as teams. Fleming was an individual, very much under the influence of the head of his department, Almroth Wright.

Florey was an excellent team leader who encouraged the ideas of his wide-ranging team.

Penicillin was the first antibiotic to be developed and marketed and it started a revolution in the treatment of infectious diseases. It has often been said that more than 200 million lives have been saved by it.

INV08 Acne Scarring: What's new and true?

Dr Bav Shergill¹

¹Glow Dermatology Ltd, United Kingdom

Session 6: Skin & Aesthetics, Discovery Room, May 10, 2019, 11:00 - 12:30

Biography:

Bav Shergill is a Consultant Dermatologist based on the South Coast who treats a wide range of cosmetic patients. He is currently the President of the British Cosmetic Dermatology Group.

I will give an overview of acne scarring treatments and share my experience of what works, what I do and what is going to be useful in the future.

OP08 The use of Lasers in connective tissue and inflammatory disorders in a tertiary laser clinic

Dr Leila Asfour¹, Dr Janice Ferguson¹, Dr Vishal Madan¹

¹Salford Royal Foundation Trust, United Kingdom

Session 6: Skin & Aesthetics, Discovery Room, May 10, 2019, 11:00 - 12:30

Biography:

Dr Leila Asfour MbChB BSc MRCP (Derm)

Dr Asfour is training in Dermatology. She has been involved in drafting the Cosmetic Practice Standards Authority (CPSA) Laser, intense pulsed light, light emitting diode (LIPLD) Standards. She is a member of the British Association of Dermatology and the Royal College of Physicians.

Introduction:

Cutaneous manifestations of connective tissue disorders still pose a challenge to manage, as they are often recalcitrant to conventional therapies. There are limited reports in the literature reviewing the efficacy of lasers in this setting.

Objective:

To assess the efficacy and role of lasers in the management of cutaneous manifestations of connective tissues disorders.

Materials and Methods:

A retrospective review was performed of all inflammatory and connective tissue disease cases assessed and treated in a tertiary laser clinic between 2010 and 2018. We reviewed demographics, diagnosis, type of laser and number of sessions, site, outcomes, other treatments, recurrence rate, complications and co-morbidities.

Results:

We reviewed 52 cases of which 30 were female. The average age was 51 (range 21-74). The commonest conditions managed were granuloma faciale, discoid lupus, limited and systemic sclerosis. Pulsed Dye Laser (PDL) was most frequently used laser (67%), followed by Carbon dioxide (CO₂) laser (15%). 10% patients received treatment with both PD and CO₂ lasers and 6% were treated with Alexandrite and PD lasers.

The most common site treated was the face. Patients required on average 5 PDL and 3 CO₂ laser sessions. A good response with marked reduction of signs was seen in 60% patients; 8% patients did not respond to laser treatment. Self-limiting complications included purpura and hyperpigmentation. One in three patients noted a relapse within two years.

Conclusions:

We report the largest cohort of patients to have undergone laser for inflammatory cutaneous pathology or cutaneous presentations of their connective tissue disease.

OP09 Rhinophyma in women: A case series

Dr Leila Asfour¹, Dr Dina Ismail, Dr Vishal Madan^{1,2}

¹Laser Division, Department of dermatology, Salford Royal NHS Foundation Trust, Salford, M6 8HD, UK, United Kingdom, ² Everything Skin Clinic, Haw bank House, Cheadle, SK8 1AL, UK1, .

Session 6: Skin & Aesthetics, Discovery Room, May 10, 2019, 11:00 - 12:30

Biography:

Dr Leila Asfour MbChB BSc MRCP (Derm)

Specialist Registrar in Dermatology at Salford Royal Foundation Trust

Introduction:

Rosacea has an overall female predominance however, rhinophyma, a feature attributed to advanced rosacea, is exceedingly rare in females. The impact of nasal skin thickening on patients' quality of life is often profound. Treatment options include oral isotretinoin for minor rhinophyma to fully ablative carbon dioxide (CO₂) laser for severe rhinophyma.

Methods:

A retrospective review of rhinophyma management in 6 female patients in a tertiary NHS laser centre and a private dermatology clinic was performed. Presentation, treatments and their outcomes were assessed.

Results:

The mean age at presentation was 47 years (27-62 years). Three patients developed rhinophyma before the age of 30 years. Two patients had moderate, whilst 4 had minor rhinophyma. Previous treatments included topical metronidazole/ ivermectin creams, oral antibiotics, isotretinoin and shave excision. Four patients underwent fractional CO₂ laser treatment with good cosmetic outcome. One patient developed scarring on nasal dorsum following fully ablative CO₂ laser, which improved with subsequent pulsed dye laser treatment. Following laser treatments, long term low dose oral isotretinoin was used in three patients, to prevent relapse. One patient solely received isotretinoin with good outcome.

Discussion:

Rhinophyma, whilst rare in females, may be associated with higher psychological morbidity. In our experience females present for treatment at an earlier age and stage of severity. Fractional CO₂ laser alone or in combination with oral isotretinoin was effective in reducing the rhinophyma in our patients.

Conclusion:

We report the first case series to our knowledge, reviewing presentation and treatment of rhinophyma in an exclusively female cohort.

OP10 Combination of IPL and Multipolar RF for Total Skin Rejuvenation

Ms Magdalena Atta-Motte, Anisah Vidale¹

¹Venus Concept UK,

Session 6: Skin & Aesthetics, Discovery Room, May 10, 2019, 11:00 - 12:30

According to Statistics MRC1, the global market for Aesthetic Lasers will reach USD 1 293.7 million by 2022, increasing by 14.3% in the period from 2016 to 2022. The ageing society, technological progress, growing awareness of the use of treatments and the increasingly common use of non-invasive procedures, as well as the changing lifestyle and increasing income of patients are factors that increase market growth regarding lasers in aesthetics. The most popular treatments are photo rejuvenation treatments, including pigmentation, redness and wrinkle where IPL devices and lasers can be used. Side effects are common, therefore managing them is important for every laser practitioner to ensure patients' safety along with achieving the best results.

Research shows that photo rejuvenation by IPL gives excellent results with minimal downtime, but it is limited by photo type of the patients. To ensure any skin type or ethnicity can be treated, it is worth designing suitable protocols for all skin types according Fitzpatrick Scale. Available papers show good results on Multipolar radiofrequency and its use for skin rejuvenation purposes, however so far, no study is focused on combination on available techniques described above and its use on different ethnicities. This study is focused on combination of:

IPL 515, 580 for photo rejuvenation Multipolar (MP)2 Radiofrequency with Pulse Electro Magnetic Fields (PEMF) and Nano fractional Radiofrequency. Consideration of the effectiveness and adverse events analysis in patients of various ethnicities including White, Black, Asian and Mixed Race.

OP11 A quality assessment tool for the conducting, reporting, and review of studies on the effectiveness of lasers in tattoo removal

Dr Albert Benjamin

GP/Medical Director Humanitas Healthcare Services Limited

Session 6: Skin & Aesthetics, Discovery Room, May 10, 2019, 11:00 - 12:30

Biography:

Dr Benjamin qualified in surgery and general practice. He is now wholly in private practice as Medical Director of Humanitas Healthcare

Services Limited. He completed an MSc in Aesthetic Medicine at Queen Mary University London in 2018 for which he submitted a dissertation on pulsed lasers for tattoo removal.

There is a need for the development of a specific quality items checklist in order to be able to uniquely perform in-depth critical appraisal of comparative effectiveness of Q-switched nanosecond, and picosecond lasers in tattoo removal. This is because it is not possible to easily adapt existing quality items checklist for this particular purpose. Possible checklists such as Cochrane Collaboration's tool¹, the Newcastle Ottawa Scale^{2,3}, the Downs and Black Checklist⁴, the Armstar checklist⁵, and the various study quality assessment tools by the National Heart, Lung, and Blood Institute - <https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools>⁶ do not address the range of study designs used. Therefore, a unique quality items checklist has been developed and proposed as a minimum data set of quality items for the design, reporting, and review of studies of laser interventions in tattoo removal. The proposed checklist has included consideration of ethical issues relating to media, industry marketing, and advertising with regards to financial outlay implications and psycho-social quality of life impact for patients.

SS09 Registration, standards, competence and regulation

Andrew Rankin¹

¹*The Joint Council of Cosmetic Practitioners,*

Session E: Education and Regulations in Medical and Cosmetic Laser Treatment, Endeavour Room, May 10, 2019, 11:00 - 12:30

Biography:

Andrew Rankin qualified as a Registered Nurse in 1989. He specialised in Intensive Care until 2006 when he moved into cosmetic medicine, undertaking his prescribing qualification in 2008.

He is partner of Regenix cosmetic medicine in Worcestershire. In addition to his independent practice, he has taken up training and advisory roles with several companies over the last 12 years.

In 2012 he became a Board Member of the British Association of Cosmetic Nurses and in 2013 he was seconded to the Government implemented cosmetic interventions review at Health Education England. As a member of the HEE Expert Reference Group he led the development of several education modalities under the Chair of Professor Sines. In this capacity he was involved in the initial, formative stages of JCCP. He liaised with regulators and cosmetic professional associations prior to presenting the JCCP as a concept for broad stakeholder consultation in 2014.

In 2014 he became Vice-Chair of the BACN. In this position he continued to work as a non-voting member of JCCP. In 2018 he relinquished his role at BACN to accept a trustee role at JCCP. He is also co-chair of the JCCP Practitioner Register Committee, responsible for development and oversight of membership and fitness to practice requirements.

Underpinning JCCP registration is a set of nationally agreed standards designed to protect the public. This agreement is broad, involving practitioners, patients and statutory regulators. For unregulated practitioners it represents a threshold for professional practice. For regulated practitioners it provides a benchmark to safeguard professional registration in what can be a confusing regulatory environment. For all groups it demonstrates credibility in an increasingly educated customer environment. With this in mind, this presentation outlines the development of JCCP leading to its current structure. For the JCCP modality of 'Lasers & Light', standards of competence are described in relation to regulated educational qualifications. Practice standards are defined broadly, with emphasis on requirements for supervision, professional development, premises and audit. These standards underpin the requirements for entry to the JCCP register and this is described in more detail. The oversight of the register, including concerns of fitness to practice, is addressed as is its important relationship to the professional statutory registers.

For the future, we touch on JCCP's self-imposed obligation to data collection – the collation and analysis of treatment numbers and adverse incidents – which will be crucial for evidence-based decision making

and informing regulatory change. Finally, we highlight how we work with other statutory regulators to promote, enforce and develop these standards.

OP22 London Aesthetic Salons / Clinics: special treatment licensing: potential disagreement between licensing body and applicant

Mr Stan Batchelor¹, Julie Robinson²

¹*Independent LPA, Abergavenny, United Kingdom,* ²*University College London Hospital NHS Foundation Trust,*

Session E: Education and Regulations in Medical and Cosmetic Laser Treatment, Endeavour Room, May 10, 2019, 11:00 - 12:30

Biography:

LPA at Guy's & St Thomas for over 25 years, now retired from the NHS and practices as an independent LPA (and RPA)

CQC National Laser Protection Adviser from 2001 to 2008 and HIW adviser from 2005 to 2007

Trains English councils, Healthcare Improvement Scotland and Jersey Health board.

Aim: Illumination of issues of joint interest between the special treatment license group of London Councils and LPA's in the delivery of safe and efficacious laser and IPL treatments.

This presentation is a summary of a discussion between the author and the London Special Treatment licensing group in 2018.

Following an invitation to give a talk to this forum, it was decided to work through the BMLA's Essential Standards and highlight areas where there is sometimes confusion or sometimes disagreement on standards which are expected to be met prior to a license being granted.

It is based on the interaction of many hundreds of the authors' clients and their journey to obtaining their special treatment licence.

It is hoped that this may be helpful to both those that may be involved in such applications and any licensing officers that also may be present in the audience. Also, the experience of others present may be shared during question time.

OP23 Update on laser & IPL standards and regulation

Dr Godfrey Town¹

¹*GCG Healthcare Ltd, Haywards Heath, United Kingdom*

Session E: Education and Regulations in Medical and Cosmetic Laser Treatment, Endeavour Room, May 10, 2019, 11:00 - 12:30

Biography:

Godfrey is RPA2000 certified in Non-Ionising Radiation protection, a Registered Clinical Technologist, holds a Cardiff University Law School Expert Witness Certificate, is an ASLMS Fellow and a member of ESLD and BMLA. He has published over 25 peer-reviewed scientific and clinical papers, sits on IEC, CENELEC and ANSI standards committees.

Lasers and intense light sources (ILS) are subject to standards and regulatory controls because of the unique potential hazard they pose to tissues of the eye and skin, including the risk of blindness and skin burns.

This talk reviews the progress of the new EC Medical Device Directive (MDD) and Regulations (MDR) first published in May 2017 which comprise requirements related to the safety and performance of medical devices and which replace the current Directive (93/42/EEC). Due for full implementation by May 2020, the MDR captures both medical devices and appliances without a medical purpose emitting high intensity electromagnetic radiation in the wavelength range 180-3000 nm used by professional practitioner and consumers to perform skin treatments such as hair and tattoo removal.

A first draft of an Implementing Regulation on common specifications (CS) for devices without an intended medical purpose has been developed by European Commission COM service in collaboration with Member States and issued in February 2019 for public consultation and will be considered by MDCG subgroups before publication. The talk reflects on likely impact on laser and ILS manufacturers and distributors and the

effect on marketing of both professional devices and home-use light-based appliances to the general public.

A review will be provided of relevant recent standards including particular requirements for consumer laser products and the development of educational standards and requirements for users of lasers and IPL.

OP24 Developments in laser eyewear standards - an update

Mr Mike Regan¹

¹*Laser Safety Advisory Ltd, Leamington Spa, United Kingdom*

Session E: Education and Regulations in Medical and Cosmetic Laser Treatment, Endeavour Room, May 10, 2019, 11:00 - 12:30

Biography:

Mike Regan is actively involved in national and international laser safety standards, having been a member of the BSI EPL76 and IEC TC76 Committees since 2001. Mike's day job is as a Certificated Laser Protection Adviser, producing site assessments for establishments in various sectors, and also liaising with manufacturers.

Over the past several years a joint IEC / ISO project has been preparing new standards on laser eyewear. The project is a collaboration between IEC/TC76/JWG12 and ISO/TC94/SC6/JWG1. The basic objective is to develop internationally agreed standards on laser eyewear. This talk will provide an update on progress that has been made since the presenter (Mike Regan) gave a preliminary talk on the subject to the 2017 BMLA Conference.

As part of the ongoing joint IEC/ISO development of the new standards, the various different approaches throughout the world need to be carefully considered and a new consensus reached on the way forward. For example, in the US the ANSI Z136.7 standard essentially rates laser eyewear filters according to the optical density (OD) at given wavelengths or wavelength ranges. By contrast in Europe the EN 207 and EN 208 standards define both the OD, and also the damage threshold or resistance class RC, and then combine the OD and RC into (LB/RB) Scale Numbers.

A new draft international standard seeking to reconcile these and other differences in approach is therefore being prepared, with the title: "Eye and face protection - Protection against laser radiation - Requirements and test methods".

This standard deals with eyewear that provides some visibility, and therefore does not include total blocking patient eye shields made e.g. of stainless steel or alloy. These latter issues are being considered in a separate new draft Technical Report that is also being prepared.

OP25 Knowledge of laser safety among health professionals within a regional laser unit

Mr Kavish Maheshwari¹, Professor Sandip Hindocha¹

¹*Bedford Hospital Nhs Trust, Bedford, United Kingdom*

Session E: Education and Regulations in Medical and Cosmetic Laser Treatment, Endeavour Room, May 10, 2019, 11:00 - 12:30

Biography:

Kavish Maheshwari

MBBS, MS (General surgery) from Delhi, India

MRCS (UK)

Mch (plastic and reconstructive surgery) from Kolkata, India

Introduction:

Laser safety is a growing concern with increasing use of laser equipment across multiple specialties. With a potential to harm the patient as well as the health care personnel involved in the use of these devices, it is important that the hazards, potential risks, safe guard measures, and precautions be known to all involved with the equipment. Regulatory authorities, rule books, and laser safety training courses all help in reduction of these, yet there is a need to acknowledge the gap of this awareness amongst health care personnel in order to plug those and make hospitals a safer environment to work in.

Materials and methods:

We at Bedford hospital NHS trust, south wing, conducted a survey amongst health care personnel who are involved with laser equipment on a regular basis to see their knowledge and awareness about laser safety. This survey was done amongst doctors and nurses in the departments of plastic surgery, ophthalmology, and urology using a questionnaire, the result of which was later analysed.

Conclusion:

There appears to be a learning need in laser safety particularly for doctors working within the field as well as a need to understand various basic norms pertinent to day to day practice.

With wider use of lasers and easier availability of the equipment, these lacunae in knowledge need to be addressed soon. We need larger surveys to emphasize the need for more frequent laser safety training.

This would go a long way in protecting both the health-care practitioners and their patients.

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Wood, K	OP19	Wood, K	OP15

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Zaleska, I			OP04, OP05
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