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Review Article

Status of Low-Level Laser Light Photobiomodulation Osteoarthritis Findings 2025

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Abstract

Among the various non-pharmacological interventions shown to partially relieve painful disabling osteoarthritis, we elected to review the present 2025 laser therapy data as applied to mitigating or repairing osteoarthritis joint damage. More specifically, we aimed to: a) examine current 2025 low level laser light research on this topic, in general and b) its regenerative/repair impact and potential as an osteoarthritis mitigation mediator of high promise. While post-treatment improvements in osteoarthritis symptoms are increasingly reported, its role in enhancing cartilage tissue cell proliferation and increased matrix synthesis, as well as soft tissue repair demand more research for purposes of solidifying its applications in clinical practice.

Keywords: Articular Cartilage; Inflammation; Low Level Laser Therapy; Osteoarthritis; Pain; Photobiomodulation; Rehabilitation; Therapy

Introduction

Osteoarthritis, the most prevalent joint disease continues to induce immense physical and psychological challenges among many aging citizens in all parts of the world. Predominantly impacting the thin layer of avascular and aneural cartilage tissue that lines the surfaces of the bones of freely moving joints such as the knee, the disease tends to progress in magnitude and severity especially if poorly treated or ignored. This degrading process that stems from a breakdown in the balance between cartilage anabolic and catabolic processes has a profound and debilitating array of daily impacts and is hard to restore, attenuate or reverse in an age group with limited or declining reparative capacities as well as an entrenched belief in the inability of cartilage to undergo repair. In addition, pain, the key feature of osteoarthritis that often reduces mobility and motivation plus the physical energy needed for moving the joint may heighten the rate of joint destruction even if the joint damage is considered modest at best.

Some evidence has accrued over the years however, implying electromagnetic light waves and others may potentially offer a means of positively reversing or ameliorating some of the pathology of osteoarthritis, including articular cartilage repair [1-4]. In particular, although not mentioned in the 2023 EULAR recommendations for osteoarthritis conservative management laser light applications of various modes may have the ability to not only alleviate pain through its potential biophysical impact on joint inflammation and accompanying adverse bone, ligament and muscle alterations, but can likely foster some form of cartilage protection/repair even if only indirectly [5,6]. Indeed, it is hypothesized that while not a cure for osteoarthritis per se, laser therapy, used alone or in conjunction with other approaches may yet prove highly beneficial not only for fostering mobility and a life of high quality, especially important in older adults, but in helping to limit its progression, even if currently discounted for knee osteoarthritis care and relief, that is, for the most widely studied joint [7-10].

Moreover, even if discounted in favor of exercise given that not all older adults can exercise readily and must otherwise rely on medications for alleviating osteoarthritis pain and inflammation and/or injections that may prove injurious, a modality that can

be applied readily with possible implications for mitigating the disease progression must be deemed to have considerable possible clinical merit in a disease context that is predicted to worsen if the willingness to move declines [11]. By contrast, possible laser derived favorable restorative and anti-inflammatory cartilage as well as muscle and soft tissue impacts may have enormous global social, economic, public health and clinical implications [12-14]. Additionally, its application when combined with other intervention modes found to reduce pain non-invasively and substantively may reduce a need for addictive medications and others that can induce a negative effect on inherent cartilage cell repair mechanisms as well as intact cartilage [15-16].

In this regard, a wealth of well designed and implemented pre-clinical studies that employ low level laser energy in the context of healthy as well as damaged cartilage cells show the cartilage cell is not inert and can be stimulated to render favorable reparative results as well as having, pain relieving muscle regenerating and anti-inflammatory impacts that may avert use of pain medications and their possible adverse influences [17,18].

Goal

Building on what is known in this realm we currently chose to specifically update what has been shown largely over time, especially within the past year [Jan 2024-Oct 2025] regarding the application of low level laser therapy in any form to actual osteoarthritis lesions or simulated models of cartilage damage and its apparent influence as a cartilage repair or regenerative analog or tissue repair mediator. The analysis was undertaken to examine if advancements have been made recently that can help solidify if this form of electromagnetic energy offered at a low intensity level is indeed a sufficiently valuable one and whether its promise as a salient line of future inquiry appears desirable. This does not discount the value of high intensity laser approaches, but is one that has more years of testing and a large preclinical set of compelling results.

Rationale

Laser therapy is a form of light energy with a theoretical clinical ability to mitigate osteoarthritis and its key tissue site of influence, namely the cartilage lining of one or more freely moving joints and thus vital for functional mobility. A structural joint tissue generally accepted as being unable to undergo repair, regeneration or adequate healing, cartilage is a current target of many who seek to mitigate osteoarthritis. Laser light is promising in this respect because of its ability to be rapidly absorbed so as to induce alterations of cell membrane potential, enzyme and intercellular matrix production of the irradiated cells. This is widely shown to occur objectively along distinct pathways using diverse precision based biochemical and molecular assays and in applications of selected tissues to relieve pain [19-26]. However, while appearing of considerable benefit in attenuating osteoarthritis damage in the laboratory, laser light pulses when marshaled or harnessed and applied to osteoarthritis cases may fail to ward off excess cartilage destruction even if it can counter pain, control inflammation, neurotransmission and collagen, protein and RNA synthesis and foster bone healing and local circulation [24,27,28]. This current analysis specifically assesses whether the above can be explained as one where the knowledge gained in one realm may not translate directly to another due to numerous methodological problems with the interpretation and design of many intervention studies especially the concomitant use of exercise, a known efficacious intervention in its own right. Second, only the knee has been studied and how the distribution of bilateral versus unilateral disease is affected is not commonly reported. Third, how laser light plus any exercise adherence and dosage impact outcomes is uncertain at best and benefits or lack of benefits may have nothing to do with laser inefficacy but with a failure to protect the joint from impact loading.

As well grouping or aggregate data plus sample criteria used to obtain a definitive intervention conclusion may fail to capture the more complex disease treatment response variations and individual situations. Moreover, study assumptions based on the degree to which experimental models accurately capture those occurring in the older adult with longstanding osteoarthritis may prove confounding. In addition, support for how muscle, bone, nerve and tendon tissues impaired in osteoarthritis may be impacted favorably posr laser irradiation, even if cartilage is not impacted is generally not studied collectively, thus its bearing on outcomes remains hard to estimate.

Based on recent superior pain related results in the clinic and favorable pre-clinical cartilage repair findings, we felt it important to try to discern the degree to which current data can be generalized despite the many research design flaws and possible suboptimal stimuli applications that may account for some past and recent lack of low level laser tissue repair success in several intervention studies, along with inadequate power and overall absence of cell and inflammatory pathway mediator measures and attributes [8].

Laser light of varying doses, frequencies and spectra may be delivered in multiple ways, making them adaptable to the problem being addressed, for example, modes include:

- Auricular acupuncture modes
- Blue, Infra-red or Red light lasers
- Dual or single wave mode lasers
- Laser acupuncture
- Laser Light Emitting Diodes [LEDS]
- Multi-wave locked system laser
- Transcranial photobiomodulation stimulation

Joint tissues that can be stimulated alone or in combination are cartilage, tendons, muscles, nerves and ligaments.

Methodology

To explore the recent data so as to establish the ongoing merits or demerits of laser therapy applied at a low level as far as cartilage attrition is concerned we elected to consult the PUBMED, PubMed Central, Science Direct and Google Scholar data bases, albeit with a focus restricted largely to the past five years and to pre-clinical studies, rather than clinical studies published before 2025. The key search terms used were- low level lasers and osteoarthritis, laser/light therapy and osteoarthritis, osteoarthritis, pain and photobiomodulation.

To grasp the content and scope of these data, posted articles were first scanned and examined individually to uncover if the research report met the present inclusion criteria-of being a full-length publication that has recently discussed some applications of laser intervention in experimental models of osteoarthritis and/or isolated cartilage tissues. All forms of laser application and research modes were deemed acceptable. Clinical studies examined elsewhere were not reviewed except for 2025 systematic review conclusions [19]. Prior data are similarly presented only in so far as unifying current findings in a field of study that began almost five decades ago [4,10,19,22,23,28].

This current search was delimited to articles on low level laser applications and osteoarthritis pathology and does not examine experiments of healthy cartilage cells or chondrocytes, lasers as a diagnostic tool, those studies related to rheumatoid arthritis or laser irradiation in acute conditions. The validity of the osteoarthritis model used in the various pre clinical studies was accepted as being reasonably representative of clinical osteoarthritis and able to thus offer insights into laser irradiation effects on destructive cartilage processes. The laser stimulation parameters employed and outcomes assessed and reported had to be those that could foster some degree of favorable change in the cartilage tissue such as cyclic hydrostatic pressure and inflammation control that might yet be applied to the human condition.

Cartilage and supportive joint structures were both studied because although superficial cartilage defects is an important factor that causes osteoarthritis disability and can have a key clinical influence, muscles, bone, nerves, ligaments and tendons may all play a role and possible mechanical, reparative, pain and regenerative influence [27,29].

As opposed to other passive non-invasive or invasive therapies therapies, laser impacts were examined to determine if they have potential to repair or help restore damaged cartilage and cartilage defects to a more mechanically functional joint tissue status, rather than just ameliorating osteoarthritis symptoms such as pain and dysfunction that may or may not restore joint integrity or provide long-term relief and cost savings. The terminology was that used in the research and the terms laser therapy, phototherapy and photobiomodulation were deemed to be comparable modes of light intervention or irradiation. Mostly anabolic impacts of laser were reported, although laser has the ability to be used to ablate rather than regenerate tissue.

Selected Findings

In terms of a role for laser therapy in osteoarthritis cartilage repair and treatment, consistent with prior similar reports, the data bases selected for this updated 2025 review yielded- some continuous support for laser therapy on osteoarthritis type cartilage states, as well as highly novel innovative research approaches related to osteoarthritis cartilage repair, regardless of osteoarthritis induced model or mode of introducing representative joint attrition processes or stimulation mode. These data that can be categorized as representing outcomes of diverse forms of single mode of low intensity laser applications mostly show one or

more applications to consistently reduce joint pain and inflammation and foster mobility in animal models such as the dog as well as humans with osteoarthritis joint damage [3,29]. In addition, its application may reduce the extent of osteoarthritis related articular cartilage attrition and degeneration that would otherwise tend to generally progress over time [30]. According to Tong, et al., 660 nm red light emitting diodes promoted proliferation and chondrogenic differentiation and the gene expression of mesenchymal stem cells, however, the effects on gene expression and mitochondrial activity decreased with time [31]. Earlier, Assis, et al., who found that low-level laser therapy impacted knee osteoarthritis degenerative processes in the rat favorably appeared to foster molecular stimuli that appeared to have the potential to aid muscle recovery post exercise in the context of exercise/laser combination applications [14].

Indeed, even if only 'positive' studies are being published currently, most clearly build on those in the past that remain highly promising. They largely report low level laser light as having favorable impacts on a return to tissue homeostasis, promoting chondroprotective effects and stimulating the components of the articular tissue in osteoarthritis induced knee lesions [32] as well as on the organization of articular cartilage of experimental models of arthritis while preserving the cartilage glycosaminoglycan content [33]. In addition, when used in combination with samples of dynamic self-regenerating cartilage this combination of laser fractional laser ablation and implanted chondrocytes cells enhances the ensuing cartilage repair processes within experimentally induced cartilage derangements, as well as its mechanical properties [34,35]. When combined with stem cells, laser therapy similarly tends to improve osteoarthritis status as observed in animal models of the disease and its analogues [36-40]. It accelerates tissue repair and a return to tissue homeostasis and enables passive chondroprotection [38,41]. Tanidah, et al., support the view that combining intra-articular mesenchymal stem cells and laser therapy in the future may effectively improve osteoarthritis outcomes, while low-level laser irradiation of cartilage may help to reshape and stimulate regenerative or healing type cartilage cellular reactions including the formation of new matrix constituents [40,42]. Kang, et al., report that laser-treated stem cells located in a culture simultaneously appeared to have the potential to repair cartilage lesions, but this depended on the critical role of mode of light used as well as its wavelength [43]. More specifically, this study that employed laser wavelengths corresponding to the absorption peaks of cytochrome C oxidase, a key mitochondrial enzyme involved in photobiomodulation-induced cellular bioenergetics showed some promise with certain parameters and modes of application not others. Used optimally laser treatments can however be expected to induce desirable chondrocyte and osteogenic proliferative responses as well as reducing synovial inflammation [44,45]. Martins, et al., likewise found the application of laser therapy effective in helping their arthritis induced joint tissues to recover from oxidative stress, while structurally preserving the articular cartilage tissue [46]. In addition to ameliorating osteoarthritis disability, Zhu, et al., suggest 1064 nm Nd:YAG laser irradiation applications can do this by enhancing estrogen levels in local cartilage tissues [47]. This mechanism can then be expected to promote the proliferation and secretion of chondrocyte collagens that may be required to secure cartilage reshaping and stability [48-50].

Additional reports show laser light as applied to a scaffold system of cartilage repair appears to have the potential to produce an important combination of mechanical and biochemical cues for regulating chondrocyte proliferation [51]. Additionally, its use as a dual-bionic photothermal nanozyme constructed to mimic antioxidases/hyaluronan synthase for osteoarthritis therapy that enhances lubrication in the early stage of the disease shows anti-oxidase-like mimicking properties that may potentially promote chondrogenesis [52]. Photobiomodulation is also found to effectively reduce postoperative swelling and enhance early mobility post-knee joint replacement surgery. These benefits appear to be valuable when added to conventional postoperative care and may help accelerate functional recovery and reduce rehabilitation time and costs [53].

Taken as a whole, these aforementioned low intensity laser light photobiomodulation applications are thus conceptually more likely than not in our view to allow for some improvements in the cartilage cellular mechanical stress relaxation cycle as well as cell proliferation activity. They may strongly influence joint swelling that can inhibit this process [54] and thereby help to mitigate some aspects of cartilage destruction as well as overall clinical distress and disability [8], musculoskeletal tissue damage and joint inflammation [26,50,54,56-60]. Stem cell applications being tested may also play a key future role in enhancing cartilage repair if subjected to selected modes of laser stimulation [40,55].

Shoutens, et al., propose that combining coaching, light therapy and pulsed electromagnetic field therapy for injured cases or those suffering several mental and physical disorders will allow them to return to work or work more effectively if already working [61]. This may be helpful in reducing absenteeism, fatigue, stress and possible declining quality of life in those suffering

work-related chronic stress and by extension an adult suffering from acute or chromic osteoarthritis reactions. Indeed, although somewhat untested at present, these ideas seem well founded and to hold promise. As per Sen, et al., and Auger, et al., bio-electromagnetic energy applications have been shown to relieve musculoskeletal pain, the main complaint of the person with osteoarthritis [62,63]. Moreover, their application can speed up wound healing [66]. In addition, they can minimize cartilage degradation and attenuate pain sensitivity [32]. Their combined usage with other therapies could produce even stronger effects than those applied alone despite a belief in the limited intrinsic degree of cartilage self-repair or renewal in the face of osteoarthritis damage and a need for osteochondral repair [26,64].

Additionally, in conjunction with cartilage tissue engineering photo oriented laser light modulation can help enhance scaffold-based repair outcomes along with observable signs of laser induced proliferation and chondrogenic differentiation [26,54,65]. Other data claim transcranial photobiomodulation techniques that involve exposing neural tissue to light waves capable of stimulating brain activity may be a crucial strategy to consider in efforts aimed at mitigating any excess declines in cognitive and brain health associated with aging.

In the interim, mechanical, cognitive, as well as biological effects of laser light alone or when coupled with pulsed magnetic fields or at certain dosages and not others are clearly likely to advance many dimensions of physical and mental health, as well as reducing pain and inflammation [12]. As well, laser therapy may possibly foster some degree of desirable tissue repair and chondrocyte cell imbalances that surely warrant future exploration. However, to validate its possible joint restorative properties and associated influences, more focus on examining its single or multiple application in valid osteoarthritis models that closely simulate chronic disease determinants is recommended. Including cases over 65 years of age and varying cartilage defects, as well as varying laser parameters and exposures appear highly important as well.

Moreover, despite differences in laser intensity and type of laser light used such as helium neon- or gallium arsenide laser we favor its apparent biological effects that include thermal, mechanical, electrical, photochemical and biostimulatory or photochemical effects as depicted to ameliorate key osteoarthritis attributes shown in Fig. 1.

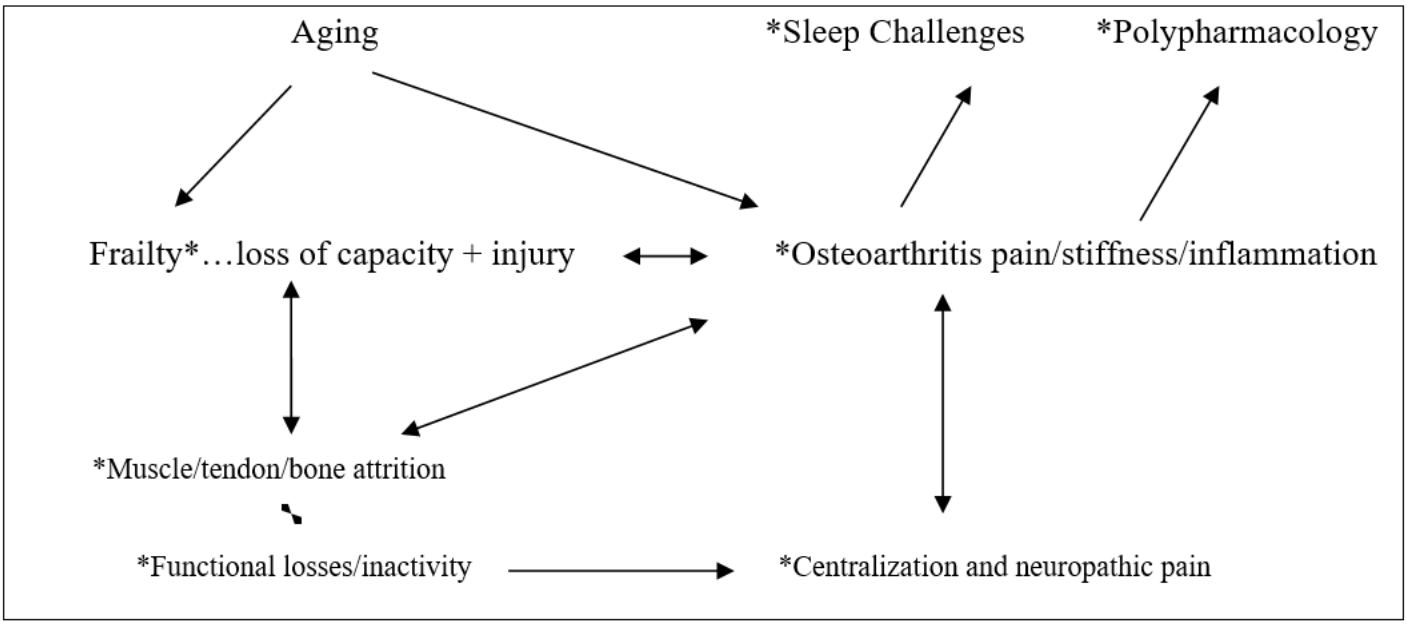

Figure 1: Possible interactions of low-level laser* and osteoarthritis that may induce multiple adverse health outcomes among the elderly and implying a strong need for integrated multi-level, targeted interventions.

However, to broaden our knowledge base, realms of possible significance to pursue more intently are those adapted from references as follows shown in Fig. 2 [2,7,13,26,44,48,53,66-70,78-82,86,87].

- Cartilage cell biosynthesis, metabolism/enzyme, matrix production processes
- Bone, muscle, tendon, and ligament maintenance and repair status
- Cognitive pain and osteoarthritis sleep attributes
- Daily function/locomotion losses and recovery
- Joint inflammation, swelling, and capsular fibrosis mitigation/prevention
- Lipidemia/obesity mitigation
- Muscle atrophy, deficient reflex responses, sarcopenia reversal
- Neuropathy, pain sensitization and impaired neural transmission
- Post exercise muscle recovery
- Post operative joint swelling
- Tissue remodeling and wound repair.
- Venous/lymphatic microcirculation

Figure 2: Realms of possible significance to pursue more intently.

Based on what we do know about disabling chronic osteoarthritis in the older population, such as its wide age range and joints affected/ unaffected and an increasing observation of the disease as a chronic inflammatory one rather than a non-inflammatory disease state, failing to extend current research observation to embrace a holistic view of the disease and one involving multiple tissues, thematic boundaries that exclude older adults and modes of inquiry that engender aggregate data alone, may prove to be suboptimal at best. Its application may also fail to alleviate suffering in the absence of careful tailoring and targeting plans of action that include joint protection education and consideration of: 1) the unique condition of and substrate being irradiated; 2) how, when and what is irradiated for how long, 3) the irradiation parameters and energy or fluence delivery, 4) the outcomes assessed and their reliability, sensitivity and validity, 5) the frequency and overall therapeutic dosage and follow up plans [62,67,68,73,86].

Dose dependent effects may also wane over time, thus long term benefits may be lost if no other remedial strategy is forthcoming [73,74].

Discussion

Osteoarthritis, studied for more than 100 years with limited understandings of its origins and treatment success, remains an increasingly prevalent disabling joint disease causing immense late life suffering and multiple functional limitations no matter where it occurs. Associated with immense direct as well as indirect health care costs that are clearly advancing incrementally and exponentially, the use of low level laser therapy as one potential disease mediator or moderator was presently revisited as a promising treatment option for remediating osteoarthritis disability. Although fraught over time with no uniformly definitive outcome or explanatory findings and multiple research gaps and flaws, laser light energy has apparent promising attributes uncovered for well over 50 years, but unfortunately has been one not readily translated clinically to any meaningful disease modifying observable degree. This is despite its effect on metabolic processes both stimulatory as well as inhibitory along with its impact on neuropathic pain and overall function demonstrated in an increasing number of pre clinical studies [73,75,78]. However, most cannot be confirmed as mirroring the actual *in-vivo* osteoarthritis disease processes at all successfully. Additionally, even laser light may induce a short-lived array of beneficial outcomes that may be helpful to the sufferer [83], as of November 1 2025, this mode of therapy has not been well substantiated or supported to date. Yet, it does seem a topic of clinical relevance as supported by increasing numbers of low-level laser or photobiomodulation therapy studies that show laser light can combat or suppress joint inflammation differentially and successfully. Several have shown interesting effects on pain and inflammation, key problems in the clinical context of osteoarthritis tissue impacts and trends indicating favorable extracellular matrix production, chondrocyte cell metabolism improvements and pain reduction [79-82]. Moreover, unlike medication, surgery or injections alone, it appears laser therapy in various dosages and wave lengths can not only foster repair of damaged cartilage, but has a favorable impact on nerves, muscles, bones, soft tissues and sleep that may be affected negatively by chronic osteoarthritis [87]. New forms of laser therapy that can penetrate deep tissues may be especially efficacious in this regard and appear promising as well [50,84].

Indeed, regardless of whether recent laser therapy osteoarthritis studies have been observational or comparative, a reader cannot fail to be impressed by the enormous 'healing' potential of laser therapy and its impact on effectively reducing pain, stiffness and overall joint and mobility dysfunction [10,75]. Moreover, it seems laser light impacts seem to occur regardless of treatment methods and disease durations and in clinical as well as cartilage lesions introduced artificially [74,77]. In addition, the full scope of any long term or structural post laser benefit may be larger than its short term benefits, but is still largely unexplored in joints other than the knee or where its unique effects are potentially contaminated by combination therapies.

It can be hypothesized however, that careful selection and delivery of stand-alone laser light pulses applied to a compromised joint will vary with modes of application and application durations and thus should be designed to evoke mechanisms that may help in averting injurious degrading enzymatic joint fluid processes, regardless of osteoarthritis damage magnitude and site. New technologies may also enable better characterization of osteoarthritis cartilage pathology that allows it to be treated at an early stage as well as how to prevent or counteract damaging inflammatory receptor pathways from mediating osteoarthritis cartilage damage at the individual level. Moreover, the application of a wider range of objective clinically relevant biomechanical and biomarker estimates and less reliance on subjective data that may be memory dependent may help to foster more confidence in the application of low-level laser light to foster or maintain optimal mechanical, radiological, kinematic and kinetic and regenerative osteoarthritis disease states in the older adult.

In this regard, establishing whether low level laser therapy applied externally can be designed to precisely target or heighten the activation of older adult osteoarthritis cartilage cells, matrix repair, bone and muscle damaged cells, nerve lesions or the prevention of progressive downward cartilage destruction, which appears plausible and possible, is strongly encouraged. Supported by most current as well as past research, insightful clinically relevant observations that foster healing and life quality benefits even in chronic cases can be anticipated and will undoubtedly help to solidify the implied value of data showing the likelihood of endogenous light sensitive opioid or distant neural receptors that appear to have the potential to specifically modify or influence immune functions and central sensitization processes when stimulated selectively [69,85,87]. A more intense examination of possible beneficial morphological impacts on osteoarthritis soft tissue structures and function, such as ligaments and inflammatory pathways in the older population rather than failing to do so, may further help to expand its utility and mechanistic underpinnings and how to maximize this so as to avert a need for addictive pain killers, surgery, as well as anti-inflammatory drugs [NSAIDS] and others, especially where the older adult is NSAID resistant.

At the same time, more efforts to ensure the nature of the pre-clinical inflicted osteoarthritis model used in the laboratory [usually the rat or rabbit subjected to trauma or noxious chemicals] so as to ensure the ensuing pathology and disease presentation do closely parallel the attributes and pathogenesis of human older adult based osteoarthritis processes with high fidelity [67,68]. In addition, to affirm, clarify or discern the unique effects of low-level laser light in osteoarthritis contexts and until agreement of its efficacy is conclusively established, we believe the role of multi-intervention trial approaches should be discouraged in order to uncover any unique stand-alone effects.

To this end, careful sampling, disease staging, instituting a washout period of at least two weeks prior to treatment session one and controlling activity levels between treatments, plus careful parameter and laser delivery modes are strongly indicated [86]. Moreover, long-term rather than short term observational studies using carefully selected devices, dosages and reliable as well as sensitive objective outcome measures applied with methodological rigor are especially encouraged [76,77].

Conclusion

In the absence of any cure and limitations on what is therapeutically safe for older adults with disabling osteoarthritis, this brief review of low level laser therapy approaches leads us conclude that a role for laser light applications in fostering function, averting or delaying joint surgery or fostering cartilage repair or both is highly promising and one not aligned with mainstream osteoarthritis pathogenic downward spiraling irreversible disabling beliefs and expectations. There is however contention about this especially from research conducted 10 years ago, thus despite a strong pre-clinical data base and safety record worthy of consideration and as recounted by most researchers in 2025 we conclude this therapy mode should not be rejected, rather the truth should be sought by applying more careful well controlled and adequately powered studies to verify the efficacy of low light laser for osteoarthritis mitigation and possible cartilage regeneration or repair. These at a minimum should be extended to include diverse acute and chronic osteoarthritis associated manifestations and subgroupings of older age adults so as to enable

the modality to become more clinically relevant, applicable and acceptable and in essence, to confirm the reports that appear to favor laser therapy as a valuable osteoarthritis intervention. and one that can foster injury recovery and avert joint degradation as well as reducing immense suffering. In undertaking careful future research, we further conclude medical providers and clinicians may not only increase the scope of their therapeutic tools, but they may also be in a better position to help shift patient beliefs about the possible futility of osteoarthritis self-management and inevitable need for surgery and encourage them towards safer modes of joint preservation and joint repair.

To aid this quest, we assert the use of agreed upon multiple reproducible and valid methods of analysis, as well as more study of muscle mechanics and its properties post laser light stimulation should be encouraged as these key osteoarthritis cartilage determinants may well show laser light is of high salience in mitigating progressive cartilage destruction as well as inflammation. Lastly, we conclude, interdisciplinary understandings of the disease as well as novel measurement approaches may further help unmask the potential hidden regenerative capacity of low-level laser therapy as a joint and life enhancing one for the older osteoarthritis sufferer.

Implications

In accord with the current interest in laser light therapies and a decline in the number of negative laser reported treatments of osteoarthritis we encourage more careful research in this realm. In addition to social and public health benefits, the synergistic effects of laser with other modalities can also be expected to broaden the scope of treatment possibilities that may have additive long-lasting temporal effects in selected cases of osteoarthritis if harnessed accordingly. In addition, the promising application of ultralow level laser therapy should be explored further in the context of non-invasive externally applied remedies to counter osteoarthritis pathology. As well, whether laser therapy can activate endogenous opioid receptors or distant neural structures that can influence immune function and central sensitization processes favorably, which would have immense treatment implications should be examined without delay to avert narcotic usage and its dire impacts on the older adult.

Conflict of Interests

The authors declare that there is no conflict of interest related to this paper.

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