REVIEW ARTICLE

Personalisation of treatments and regenerative therapy in aesthetic dermatology: innovations and individualised approaches to skin health

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Keywords: Aesthetic Dermatology; Regenerative Therapy; Personalized Medicine; Biomaterials; Tissue Engineering

ABSTRACT

Introduction: Aesthetic dermatology has revolutionised in recent years, driven by technological advances and the growing demand for more effective and personalised treatments. Personalising skin care allows procedures to be tailored to the individual characteristics of each patient, taking into account factors such as skin type, age, health history and lifestyle. In addition, regenerative therapy has emerged as an innovative approach, promoting cell renewal and improving skin quality in a natural and lasting way.

Methods: This study is based on a systematic review of the scientific literature, analysing articles published between 2015 and 2025 in databases such as PubMed, Scopus and Web of Science. Studies that investigate the effectiveness of personalised dermatological treatments and regenerative therapies, considering clinical, technological and biological aspects, were included. The selection of articles followed strict criteria, prioritising research with significant samples and well-established methodologies.

Results: The data analysed indicate that personalising dermatological treatments significantly improves clinical results, reducing adverse effects and increasing patient satisfaction. Technologies such as artificial intelligence, 3d bioprinting and nanotechnology have enabled more accurate diagnoses and highly individualised treatments. In addition, regenerative therapy, based on exosomes, stem cells and growth factors, has shown great potential in skin restoration, promoting rejuvenation and repair of damaged tissues.

Discussion: The personalisation of dermatological treatments represents a significant advance in modern aesthetics, allowing for more effective and safer approaches. Integrating artificial intelligence into skin analysis enables more accurate diagnoses and personalised recommendations, while nanotechnology improves the absorption of active ingredients and enhances the effects of treatments. Regenerative medicine, in turn, has revolutionised dermatology by stimulating cell regeneration and reducing the need for invasive procedures. However, challenges such as accessibility, cost and regulation still need to be overcome for these innovations to be widely adopted.

Conclusion: Personalised dermatological treatments and regenerative therapy represent a new paradigm in aesthetics, offering more effective solutions tailored to the individual needs of patients. The combination of advanced technology and biotechnology has enabled more natural and long-lasting results, promoting not only aesthetic improvements but also skin health. Future studies should focus on expanding access to these technologies, ensuring that more people can benefit from these innovations.

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What do we already know about this topic?
Personalization of treatments and regenerative therapy in aesthetic dermatology are areas of great innovation, which have been transforming the way skin health is approached. In recent years, aesthetic dermatology has moved away from standardized protocols and towards personalized treatments, taking into account individual factors such as skin type, genetic predisposition, clinical history and lifestyle. Personalization of dermatological care has been driven by new technologies, such as artificial intelligence, nanotechnology and bioengineering, allowing for more accurate diagnoses and highly individualized interventions. Skin analysis through intelligent systems enables specific recommendations for products, procedures and therapies, ensuring more effective results with fewer adverse effects.At the same time, regenerative therapy has gained prominence as one of the most promising advances in aesthetic dermatology. Stem cells, exosomes and platelet-rich plasma (PRP) are some of the strategies used to stimulate cell regeneration and restore skin quality in a natural and lasting way. These minimally invasive methods can improve skin elasticity, reduce signs of aging, and optimize tissue healing. In addition to the aesthetic benefits, these approaches have significant impacts on skin health, promoting resistance against environmental damage and accelerating recovery after dermatological procedures. However, challenges such as high cost, regulation, and standardization of clinical protocols still limit the large-scale implementation of these innovative technologies. The future of aesthetic dermatology points to a growing integration of science, technology, and personalization, making treatments more effective and accessible. As new research deepens knowledge about regenerative medicine and artificial intelligence applied to dermatology, the expectation is that more patients will be able to benefit from these innovations, ensuring improved results, greater safety, and well-being in skin health.
What is the main contribution to Evidence-Based Practice from this article?
The main contribution of this article to evidence-based practice is the in-depth analysis of the personalization of dermatological treatments and regenerative therapy, highlighting how these innovative approaches can improve clinical outcomes and optimize skin health.
The research brings together scientific evidence on the impact of individualizing dermatological care, considering factors such as skin type, genetic predisposition and environmental conditions. In addition, it explores the role of stem cells, exosomes and platelet-rich plasma (PRP) in skin regeneration, providing a solid basis for the application of these techniques in clinical practice.Another relevant aspect is the integration of artificial intelligence and nanotechnology in aesthetic dermatology, allowing for more accurate diagnoses and personalized treatments. The analysis of the studies demonstrates that these technologies reduce adverse effects and increase the effectiveness of procedures, reinforcing the importance of precision medicine in dermatology.Finally, the article contributes to evidence-based clinical decision-making, assisting health professionals in choosing the most effective and safe approaches for each patient. By consolidating data on new therapies and technological advances, it promotes a more informed dermatological practice aligned with the individual needs of patients.
What are this research's implications towards health policy?
The research deepens the understanding of the biological mechanisms involved in cell regeneration and personalization of dermatological care. The analysis of the interaction between stem cells, exosomes and growth factors contributes to theoretical models on skin rejuvenation and tissue repair. In addition, it reinforces the importance of precision medicine in dermatology, highlighting how genetic and environmental factors influence the response to treatments.Personalization of dermatological treatments allows for more effective and safer approaches, reducing adverse effects and optimizing results. The integration of artificial intelligence and nanotechnology enables more accurate diagnoses and individualized recommendations. In addition, regenerative therapy, based on stem cells and exosomes, has shown great potential in skin restoration, promoting rejuvenation and repair of damaged tissues.This study reinforces the need for public policies aimed at personalized medicine, promoting access to genetic testing and regenerative therapies. It also highlights the importance of investing in translational research, allowing scientific advances to be rapidly integrated into medical practice. In addition, it can influence guidelines on the incorporation of new technologies into the healthcare system, ensuring innovative treatments for patients seeking improvements in skin health.
The impact of this article can contribute to new therapeutic approaches, influencing both drug development and policy formulation for aesthetic dermatology.**Authors' Contributions Statement:**
Monaly da Silva Ribeiro was the main author of the manuscript, contributing to writing parts of the introduction, methodology, results, discussion, conclusion and tables. Maria Graziela de Fátima Alvarez Kenupp wrote as a co-author, contributing to the preparation of the introduction, discussion and writing of the tables.

Introduction

The pathophysiological dynamics of the skin as an organ integrates cellular and molecular mechanisms that modulate inflammatory, immunological and regenerative responses, determining elements for the maintenance of tissue homeostasis and for the repair of dermal lesions resulting from external and internal insults (de Araújo Pereira, 2025). Changes in this physiological balance, caused by degenerative processes, intrinsic ageing, environmental factors or trauma, configure clinical conditions that demand specific and progressively personalised therapeutic interventions (Paciello, 2025). In the context of aesthetic dermatology, this context encourages

the transition from traditional approaches to more precise and sophisticated therapeutic models, anchored in the principles of personalised medicine and the adoption of regenerative techniques adapted to individual needs (Trovato et al., 2024). Advances in understanding the molecular and histological bases of ageing and skin degeneration processes have enabled the formulation of personalised therapeutic strategies, which are based on the analysis of biomolecular and genetic profiles (Paciello, 2025, Santos et al., 2024, Roque, de Araújo Pereira, 2025). These profiles allow the definition of therapeutic protocols adjusted to the phenotypic characteristics and specific clinical conditions of each individual. Within this scenario, autologous and biostimulatory therapies have stood out for their clinical applicability and satisfactory tissue response, with emphasis on the use of platelet-rich plasma (PRP), leukoplatelet fibrin membranes (L-PRF) and procedures combined with ozone therapy (Santos et al., 2024, Roque, de Araújo Pereira, 2025). The scientific basis for these therapies lies in the ability of the applied endogenous factors to promote fibroblast activation, collagen synthesis, and reorganisation of the extracellular matrix, processes that, together, result in skin regeneration and improvement of the skin's biomechanical parameters. Recent studies demonstrate measurable increases in dermal elasticity and density after sequential protocols using PRP, confirming the potential of these interventions as part of a modern and adaptable therapeutic arsenal (Gadelha et al., 2024).

Technological innovations, particularly those arising from bioengineering and pharmacogenomics, have expanded therapeutic perspectives by making available advanced biomaterials, three-dimensional scaffolds, and intelligent controlled-release systems. These technologies provide physical and biochemical support to the treated tissue, mimicking the dermal matrix and favouring a more effective integration of regenerative therapies into the skin architecture (Cong, 2024, Pourang, Rockwell, Karimi, 2020). The clinical applicability of these resources, although promising, still faces regulatory and methodological obstacles, especially about the need for standardisation of protocols and homogenization of clinical evaluation criteria (Mehta, Bishnoi, Dogra, 2022).

Research still points to a significant gap between the results documented in experimental studies and the effectiveness observed in diverse clinical scenarios, evidencing the interindividual variability in therapeutic responses. This variability results from the complex interaction between genetic, biochemical and environmental factors, posing a substantial challenge to the universalisation of regenerative therapies (Rahman et al., 2025). Methodological improvement and segmentation of study groups by biomolecular profiles thus appear as essential strategies to optimise the clinical response.

In the specific field of aesthetic dermatology, autologous biofactors combined with bioactive biomaterials have been consolidating themselves as viable alternatives for facial rejuvenation procedures, scar repair and dermal restructuring after invasive interventions. Controlled clinical trials demonstrate high efficacy in improving skin texture and tone, significantly reducing the visibility of wrinkles and dermal imperfections (Perobeli, 2020, Miller-Kobisher, Suárez-Veja, De Maldonado, 2021). These findings reinforce the need to integrate therapeutic models based on personalisation and the use of adaptive regenerative resources.

Personalisation of aesthetic treatments requires not only rigorous identification of clinical

conditions, but also the establishment of technical parameters for longitudinal monitoring of therapeutic responses. The literature points to the relevance of adopting histopathological examinations, bioimaging analyses and biochemical tests as instruments for assessing the efficacy and safety of regenerative interventions, promoting greater precision in defining clinical conducts (Freitas et al., 2022; Lippi et al., 2024).

Another aspect refers to the ethical and regulatory limitations that still circumscribe the full application of personalised regenerative therapies. Issues related to biosafety, expanded informed consent, and monitoring of adverse events remain prominent in international discussions, which imposes the need for regulatory guidelines that articulate technological innovation and clinical safety (Mehta, Bishnoi, Dogra, 2022, Cong, 2024).

By proposing a systematic review of the literature on the personalisation of treatments and regenerative therapies applied to aesthetic dermatology, this study aims to systematise the available scientific knowledge, identify the most relevant technological advances, and expose the methodological and clinical gaps that still permeate this area. The aim is to contribute to the consolidation of evidence-based clinical practices and strengthen the research axes that support the continuous evolution of aesthetic dermatology in the contemporary biomedical horizon.

Methodology

This study is a systematic literature review (SLR), designed in accordance with the methodological recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The main objective was to identify, select and synthesise published scientific evidence on therapeutic personalisation and regenerative therapies in aesthetic dermatology, considering the advances documented between 2015 and May 2025. The choice of this methodological approach sought to ensure a comparative and integrative analysis of international scientific production, focusing on the clinical, biotechnological and procedural dimensions that underpin the incorporation of therapeutic innovations into dermatological practice.

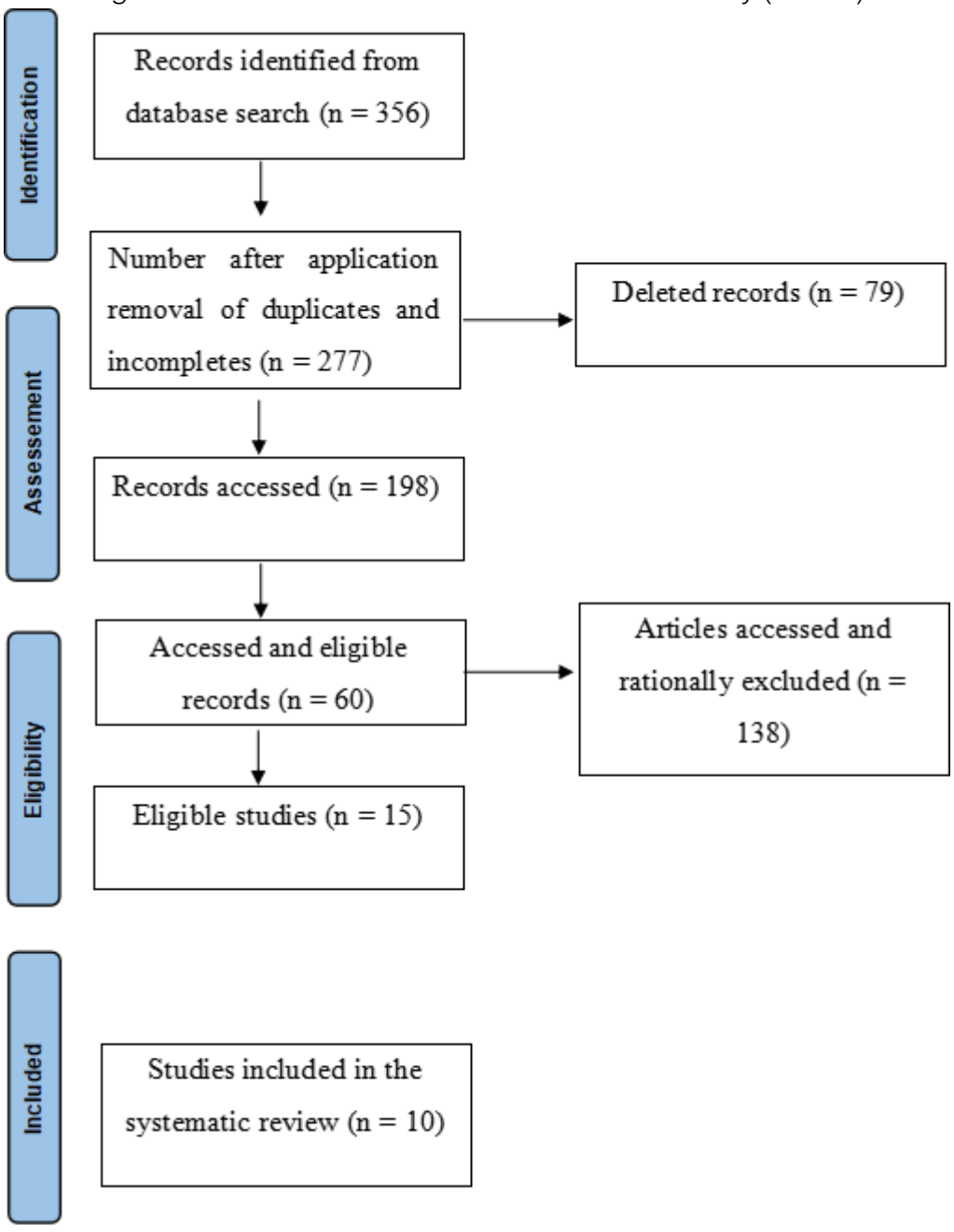
The search strategies were executed between January and March 2025 in widely recognised and indexed databases: PubMed, LILACS, Scielo, Web of Science and Embase. The strategy formulation included the combined use of controlled descriptors and free terms, in English, such as: “Aesthetic Dermatology”, “Personalized Therapy”, “Regenerative Medicine”, “Platelet-Rich Plasma”, “Skin Rejuvenation”, “Tissue Engineering”, “Biomaterials”, “Clinical Trials”, “Dermatologic Procedures” and “Innovative Approaches”. The application of the Boolean operators AND and OR allowed the broadening of the thematic scope, ensuring the inclusion of publications relevant to the scope of the study.

Primary articles published in peer-reviewed journals, from 2019 to 2025, in English and Portuguese, that addressed personalised therapeutic interventions and regenerative techniques applied to aesthetic dermatology were included. Randomised clinical trials, observational studies, systematic reviews and meta-analyses with explicitly described methodologies and original clinical results were considered eligible. Exclusion criteria included duplicate articles, narrative reviews, isolated case reports, editorials, letters to the editor, book chapters, and publications without access to the full text.

The initial screening consisted of two independent reviewers reading the titles and abstracts, applying the previously defined inclusion and exclusion criteria. Potentially

eligible articles were subjected to full reading to confirm thematic and methodological adherence. Disagreements between the reviewers were resolved by consensus, and if disagreements persisted, a third evaluator was called upon. After this stage, 15 studies were included in the final sample for detailed analysis, 10 of which were used in the SLR (Figure 1).

Figure 1 - Flowchart of articles included in the study (n = 15)



Source: Prepared by the author (2025)

The following information was extracted from the selected articles: year of publication, country of origin, methodological design, size and profile of the sample studied, type of therapeutic intervention, description of the biomaterials and techniques applied, clinical outcomes evaluated and conclusions reported. The data categorisation sought to identify trends regarding efficacy, safety, customisation of protocols and clinical results observed in different contexts (Appendix 1).

The methodological quality of the included studies was assessed with validated instruments, considering the design of each publication. For randomised clinical trials, the Cochrane Risk of Bias Tool (Rob 2) was applied, analysing random sequence generation, allocation concealment, masking and reported outcomes. In observational studies, the Newcastle-Ottawa Scale (NOS) was used, covering selection, comparability and outcome assessment criteria. This assessment was performed by two reviewers independently.

Data synthesis was conducted descriptively, highlighting the main findings related to treatment personalisation and regenerative techniques. Categorical variables were organised in tables to facilitate comparative visualisation of results. No meta-analysis was performed due to the heterogeneity of methodological designs and the diversity of outcomes analysed among the included studies.

Results

Systematic analysis has shown that interventions based on PRP and L-PRF dominate regenerative therapeutic applications in aesthetic dermatology. Studies highlight that these autologous biomaterials act as natural vehicles for growth factors and cytokines, inducing consistent regenerative effects, especially in skin rejuvenation and dermal biostimulation (Paciello, 2025; Santos et al., 2024). Observational investigations and controlled clinical trials have reported measurable improvements in dermal elasticity and collagen density, demonstrating a positive impact on the extracellular matrix.

Another relevant finding refers to the clinical efficacy observed in combined protocols of PRP and microneedling techniques, which were considered superior to isolated methods. Gadelha et al. (2024) highlighted, in a study with 45 patients, a significant increase in skin firmness and tone after sequential applications, a result that reinforces the synergy between mechanical and biochemical stimulation in the induction of neocollagenesis. Roque and Lima (2023) demonstrated similar results with the use of ozonated I-PRF, which provided significant gains in tissue oxygenation and dermal regeneration (Table 1).

Table 1 - Distribution of the main regenerative techniques and their clinical results

Technique	Number of studies	Predominant clinical results	Reported adverse events
PRP (Platelet Rich Plasma)	6	Increased skin firmness; reduction of wrinkles	Mild reactions (erythema, local edema)
L-PRF (Fibrin-rich membrane)	2	Accelerated healing; regeneration of the dermal matrix	No serious events
Ozonated I-PRF	1	Improved tissue oxygenation and enhanced biostimulation	No significant adverse events
EGF (Epidermal Growth Factor)	1	Increased skin texture; facial rejuvenation	High tolerance
Aesthetic acupuncture + Regenerative therapies	1	Reduction of dynamic wrinkles; visible clinical improvement	No relevant events

Source: Prepared by the author (2025)

The systematic reviews included showed consensus regarding the safety of autologous biomaterials. None of the studies analysed reported serious adverse events, and local reactions, when present, were classified as mild and self-limiting, generally resolving without the need for additional medical intervention (Samadi, Sheykhhasan, Khoshinani, 2019, Rahman et al., 2025). The low immunogenicity and inherent biocompatibility of autologous materials were highlighted as key factors for widespread clinical acceptance.

The data from the studies revealed significant variability in the platelet concentrations used, as well as in the volumes and frequency of applications (Table 2). Perobeli (2020) documented that most of the protocols analysed ranged from 2 to 5 ml per application, with sessions spaced between 15 and 30 days, totalling three to six sessions per therapeutic cycle. This methodological heterogeneity was pointed out as one of the main limitations for direct comparison of clinical results between studies (Mehta, Bishnoi, Dogra, 2022).

Table 2 - Methodological characteristics of the included clinical trials

Study	Type of study	Sample	Main intervention	Frequency/sessions	Outcomes assessed
Gadelha et al. (2024)	Observational	45 patients	PRP + Microneedling	4 sessions / interval 30d	Tonicity, dermal elasticity
Roque; Lima (2023)	Experimental	30 participants	Ozonated I-PRF	3 sessions / 21d interval	Oxygenation and dermal regeneration
Freitas et al. (2022)	Clinical	20 patients	Aesthetic acupuncture + Regenerative therapy	6 sessions / 15d interval	Reduction of dynamic wrinkles
Miller-Kobisher et al. (2021)	Systematic review	NS*	EGF	Various protocols	Facial rejuvenation, healing
Perobeli (2020)	Systematic review	NS*	PRP	Various protocols	Elasticidade cutânea

Legend: NS = Not specified. Source: Prepared by the author (2025)

The clinical impact of the interventions was measured using standardised aesthetic assessment scales, such as the Global Aesthetic Improvement Scale (GAIS), and comparative photographic records. Miller-Kobisher et al. (2021) reported that 85% of patients treated with epidermal growth factors (EGF) showed significant clinical improvement, with a reduction in wrinkles and an increase in dermal texture. These results reinforce the relevance of incorporating bioactive factors in enhancing regenerative effects (Trovato et al., 2024).

Another important finding refers to technological innovations applied in tissue engineering, particularly smart biomaterials and three-dimensional scaffolds. Cong (2024) highlighted the experimental use of bioactive hydrogels as support for aesthetic applications, aiming to replicate dermal architecture and optimise skin regeneration in scarring procedures. Although promising, such resources are still in the experimental phase and lack broad clinical validation.

The integration of autologous technologies with minimally invasive procedures has also proven to be a consolidated trend. Freitas et al. (2022) reported the efficacy of aesthetic acupuncture as a complementary strategy in the treatment of dynamic wrinkles, demonstrating that the association with regenerative therapies amplifies the clinical effects, reducing the need for additional pharmacological interventions. These findings reinforce the importance of the multimodal approach in the personalisation of aesthetic treatments (Lippi et al., 2024).

The reviews analysed highlighted the lack of large-scale multicenter and randomised clinical trials, a fact that limits the generalisation of the observed results. Rahman et al. (2025) and Trovato et al. (2024) reinforced that, although preliminary data are promising, the lack of

standardisation and methodological variability between studies poses substantial challenges for the widespread incorporation of these therapies into consensual clinical protocols. Finally, it was found that personalised interventions are in line with contemporary guidelines in aesthetic dermatology, which prioritise treatments that are adaptable to the biological particularities of each patient. Pourang, Rockwell and Karimi (2020) reinforce that personalisation based on biomolecular profiles and individual clinical histories optimises results and minimises risks, pointing to a therapeutic future increasingly guided by precision medicine.

Discussion

The analysis of the results demonstrates that personalised regenerative therapies have been gaining ground in aesthetic dermatology, consolidating a methodological trend that combines biotechnology and personalised medicine to improve clinical efficacy. The predominance of interventions with PRP and L-PRF reflects the trust placed in these autologous biomaterials by the reviewed scientific literature. Paciello (2025) and Paulino et al. (2024) point out that the regenerative potential of these materials derives from the high concentration of growth factors, which, when applied in a segmented and individualised manner, promote superior results in facial rejuvenation and dermal biostimulation treatments.

The methodological design of the studies analysed revealed significant heterogeneity, both in the protocols applied and the techniques for preparing and administering the biomaterials. This variability makes it difficult to standardise clinical procedures and limits direct comparability between clinical trials. According to Mehta, Bishnoi and Dogra (2022), the lack of standardisation compromises not only the reproducibility of results but also the formulation of therapeutic consensus applicable in different healthcare contexts, a point that should be prioritised in future investigations.

Gadelha et al. (2024) demonstrated consistent results when associating PRP with microneedling, confirming the hypothesis that the synergy between physical and biochemical stimuli enhances tissue regeneration. This finding reinforces the notion that combined strategies may be more effective than isolated therapies, as advocated by Roque and Lima (2023) in their research with ozonised I-PRF, which also obtained notable increases in oxygenation and dermal restructuring. This approach highlights the importance of integrating different techniques to enhance regenerative effects and optimise clinical outcomes.

The safety of the analysed therapies was satisfactory in all included studies. The adverse reactions reported were predominantly mild, self-limited, and did not require relevant medical intervention, as verified by Samadi, Sheykhhasan, and Khoshinani (2019). These data consolidate the perception that autologous biomaterials offer high biocompatibility and minimal risk of serious complications, fundamental characteristics for the safe expansion of these techniques in dermatological routine.

A critical analysis of the literature also highlighted methodological limitations related to the assessment of clinical efficacy. Many studies based their conclusions on subjective outcomes, such as aesthetic scales and photographic records, without robust support from histological examinations or objective biochemical markers. Miller-Kobisher et al. (2021) emphasise the need to incorporate more accurate diagnostic methods to qualify the results, especially in interventions aimed at

dermal restructuring and deep regeneration. Cong (2024) emphasises that innovations in biomaterials, including bioactive hydrogels and three-dimensional scaffolds, constitute a promising frontier in tissue engineering applicable to aesthetic dermatology. Despite the potential identified, most of these technologies still lack broad clinical validation, which prevents their immediate incorporation into everyday practice. This gap reinforces the importance of promoting controlled clinical studies that confirm the efficacy and safety of these innovative materials, especially in complex procedures such as scar revisions.

Another relevant aspect discussed in the literature concerns the integration of regenerative therapies with minimally invasive complementary approaches. Freitas et al. (2022) demonstrated that aesthetic acupuncture, when associated with biostimulatory therapies, enhances therapeutic effects and can reduce the need for additional pharmacological treatments. This multimodal treatment model corroborates the premise that therapeutic personalisation should consider not only the skin biotype, but also the integration of different therapeutic resources that act synergistically.

The systematic reviews analysed highlighted the urgent need for multicenter clinical trials with representative samples to validate preliminary findings and strengthen clinical recommendations. Rahman et al. (2025) and Trovato et al. (2024) emphasise that, despite the progress made in recent decades, the field of aesthetic dermatology still lacks robust protocols that ensure replicability and consistency of results in different populations and geographic contexts.

Another critical point concerns the cost of regenerative therapies and patient accessibility. Mehta, Bishnoi and Dogra (2022) emphasise that, although autologous biomaterials have relatively low costs, the need for specialised equipment and adequate technical training still constitutes a barrier to the dissemination of these techniques in regions with limited resources. This reality poses challenges for the universalisation of regenerative therapies and the democratisation of access to advanced aesthetic treatments.

The discussion on personalisation of treatments is not limited to the choice of biomaterials and techniques applied. Pourang, Rockwell and Karimi (2020) argue that full personalisation involves genetic mapping, analysis of clinical history and identification of environmental factors that may interfere with the therapeutic response. This perspective broadens the concept of regenerative aesthetic medicine and points to a therapeutic model that is increasingly data-driven and anchored in precision medicine.

From an ethical and regulatory perspective, the reviewed literature indicates that, although regenerative therapies have a good safety profile, there is still a need for more specific guidelines to regulate the collection, preparation, and application of autologous biomaterials. Cong (2024) warns of the potential risks associated with the indiscriminate use of these therapies without adequate scientific validation, reinforcing the importance of effective health surveillance policies. Finally, Lippi et al. (2024) emphasise that regenerative therapies in aesthetic dermatology transcend mere cosmetic intervention and should be understood as an integral part of broader strategies to promote health and well-being. This holistic approach reinforces the relevance of the topic and justifies continued investment in research that combines technological innovation and sustainable clinical benefits. The results consolidated in this study show that therapeutic personalisation and regenerative

innovations represent significant advances for contemporary aesthetic dermatology. However, methodological, regulatory and operational challenges still need to be overcome for these approaches to become definitively established as a safe, effective and accessible standard of care.

Conclusion

The results obtained from the systematic review show that the personalisation of treatments and the adoption of regenerative therapies represent a progressive transformation in the practice of aesthetic dermatology. The predominance of the use of autologous biomaterials, such as platelet-rich plasma and leukoplatelet fibrin membranes, as well as the incorporation of emerging technologies, demonstrates a significant methodological advance towards more precise interventions that are adaptable to individual clinical particularities.

The evidence analysed points to substantial clinical benefits of these therapies, especially regarding the improvement of skin elasticity, dermal biostimulation and the acceleration of healing processes, with reduced records of adverse effects. The critical analysis, however, identified significant methodological heterogeneity among the studies reviewed, a fact that limits the direct comparability of results and hinders the formulation of standardised and consensual protocols.

The data also revealed gaps in large-scale multicenter clinical trials and the need for greater rigour in the objective assessment of clinical outcomes. Issues related to the standardisation of biomaterials, longitudinal monitoring, and regulatory structuring remain latent challenges for the definitive consolidation of these approaches in clinical practice. Personalised regenerative therapies emerge as promising alternatives not only for aesthetic restructuring but also as part of integrated skin health strategies, promoting sustainable results aligned with contemporary principles of precision medicine. Continuing research should prioritise robust methodologies, with replicable designs and objective assessments that support the development of safe and effective clinical guidelines. It is concluded that personalisation and technological innovation play a central role in the evolution of aesthetic dermatology, and their strengthening requires coordination between scientific research, technological development, and health regulations, ensuring that such advances are incorporated in an ethical, safe, and widely accessible manner.

Abbreviations

EGF- Epidermal Growth Factors, GAIS - Global Aesthetic Improvement Scale, L-PRF - Leukoplatelet Fibrin Membranes, NOS - Newcastle-Ottawa Scale, PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analyses, PRP - Platelet Rich Plasma, RoB 2 - Cochrane Risk of Bias Tool, RSL - Systematic Literature Review.

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