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RESEARCH ARTICLE

A REVIEW ARTICLE ON ROLE OF AYURVED IN MUSCLE HEALTH AND NUTRITION

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Abstract

Muscle tissue is essential for maintaining strength, mobility, posture, metabolic functions, and overall physical health. Contemporary nutritional science highlights the importance of adequate protein intake, essential amino acids, micronutrients, and physical activity for muscle growth and preservation. Ayurveda provides a comprehensive and holistic perspective on muscle health through the concept of Mamsa Dhatu, one of the seven fundamental body tissues responsible for structural integrity, locomotion, and physical endurance. According to Ayurvedic principles, the nourishment and maintenance of Mamsa Dhatu depend on efficient digestive and metabolic processes governed by Agni**,** proper tissue formation through DhatuPoshana, balanced Doshas, and the intake of wholesome and nourishing Ahara.Unlike the modern view that primarily focuses on nutrient consumption, Ayurveda considers muscle nourishment as the result of a sequential transformati on of nutrients from Rasa Dhatu to subsequent Dhatus, culminating in the proper formation of Mamsa Dhatu. Impairment of Agni, Dosha imbalance, inadequate nutrition, sedentary lifestyle, excessive physical exertion, chronic illness, and aging can adversely affect muscle develop ment and maintenance. Ayurvedic interventions such as Brimhana Ahara**,** Rasayana therapy, appropriate exercise (Vyayama), adequate sleep, and lifestyle regulation are described as important measures for promoting muscle strength, bulk, and functional capacity. This review explores the Ayurvedic concepts of Mamsa Dhatu, Dhatu Poshana, Agni, and factors influencing muscle nourishment, while correlating these principles with contemporary understanding of muscle metabolis m and nutrition.

The article highlights the relevance of Ayurvedic dietary and lifestyle approaches in maintaining muscle health and discusses their potential applications in preventive healthcare, sports nutrition, healthy aging, sarcopenia

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management, and rehabilitation. An integrative understanding of Ayurvedic and modern perspectives may offer a comprehensive framework for optimizing muscle health and overall well-being.

Introduction:-

Muscles constitute approximately 40–50% of total body weight and are essential for locomotion, posture maintenance, thermogenesis, and metabolic regulation. Skeletal muscle health significantly influences physical performance, recovery from illness, and healthy aging. Disorders such as sarcopenia, cachexia, muscular dystrophy, and malnutrition highlight the importance of maintaining optimal muscle nutrition.[1]

In Ayurveda, muscle tissue is represented by Mamsa Dhatu, one of the seven fundamental body tissues (Sapta Dhatu). Mamsa Dhatu provides covering, strength, stability, and form to the body.[2] The process of muscle nourishment is explained through the theories of Dhatu Poshana, Agni, and Srotas. Proper nourishment of Mamsa Dhatu depends on balanced digestion, metabolism, and tissue-specific transformation of nutrients. Understanding these concepts offers valuable insights into muscle health from a holistic perspective.Ayurveda not only describes Mamsa Dhatu as the structural tissue responsible for body bulk and strength but also elaborates the concept of Mamsa Sara Purusha**,** individuals possessing excellently nourished muscle tissue characterized by well-developed musculature, firmness, stability, physical endurance, and superior strength. These features closely resemble modern indicators of optimal muscle tone and muscle quality. Recent studies have attempted to evaluate Mamsa Sara in relation to muscle tone and functional performance, providing a scientific basis for the Ayurvedic understanding of muscular health.[3]

Materials and Methods: Study Design:-

This study was conducted as a narrative review to explore the Ayurvedic concepts of Mamsa Dhatu and muscle nourishment and to correlate them with contemporary understanding of muscle physiology and nutrition.

Literature Sources:-

A comprehensive literature search was carried out using both classical Ayurvedic texts and modern scientific databases.

Ayurvedic Literature Review:-

Primary Ayurvedic references were collected from classical texts including:-

- Charaka Samhita
- Sushruta Samhita
- Ashtanga Hridaya
- Ashtanga Sangraha

Relevant references related to Mamsa Dhatu, Mamsa Sara, Dhatu Poshana Nyaya, Agni, Dhatwagni, Brimhana, Balya, Rasayana, Vyayama, and Mamsa Dhatu Kshaya were identified, compiled, and critically reviewed. Commentaries by Chakrapanidatta, Dalhanacharya, and Arunadatta were consulted wherever applicable for better interpretation of classical concepts.

Modern Literature Review:-

Electronic databases including PubMed, Google Scholar, Scopus, and ResearchGate were searched for relevant articles published in English. Additional sources were identified through reference tracking of selected articles.

Keywords used for literature search included:-

- Muscle nutrition
- Skeletal muscle metabolism
- Muscle protein synthesis
- Sarcopenia
- Muscle regeneration
- Sports nutrition
- Healthy aging
- Ayurveda and muscle health
- Mamsa Dhatu

- Mamsa Sara
- Dhatu Poshana
- Rasayana

Inclusion Criteria:-
- Classical Ayurvedic references describing Mamsa Dhatu and its nourishment.
- Peer-reviewed articles related to muscle physiology, nutrition, exercise science, sarcopenia, and tissue regeneration.
- Review articles, clinical studies, observational studies, and experimental research relevant to muscle health.
- Articles published in English.

Exclusion Criteria:-
- Studies unrelated to muscle physiology or nutrition.
- Non-peer-reviewed literature with insufficient scientific evidence.
- Duplicate publications and articles lacking full-text availability.

Data Extraction and Analysis:-
Relevant information pertaining to the formation, functions, nourishment, and disorders of Mamsa Dhatu was extracted from Ayurvedic texts and compared with contemporary concepts of muscle metabolism, muscle protein synthesis, tissue regeneration, and nutritional physiology. The collected data were analyzed descriptively and synthesized to develop an integrative understanding of muscle nourishment from both Ayurvedic and modern scientific perspectives.

Concept of Mamsa Dhatu in Ayurveda:-
Mamsa Dhatu is the third tissue formed during the sequential nourishment of the Dhatus. According to Charaka, the essence of Rakta Dhatu undergoes transformation through Mamsagni to form Mamsa Dhatu.[2]

Functions of Mamsa Dhatu [2-4]:-
The primary functions include:-
- Covering and protection of internal organs
- Maintenance of body contour and structure
- Strength and stability
- Facilitation of movement
- Support of ligaments and tendons

Sushruta described Mamsa as responsible for body firmness and physical endurance.

Upadhatu and Mala of Mamsa[5]:-
- **Upadhatu:** Vasa (muscle fat)
- **Mala:** Secretions from body openings such as ear, nose, and eyes according to certain commentators.

Mamsa Sara and Muscle Quality:-
Charaka described Mamsa Sara Purusha as individuals possessing compact, firm, well-developed muscles with excellent strength, enthusiasm, tolerance to physical exertion, and stable body structure. These characteristics indicate superior nourishment and optimal functioning of Mamsa Dhatu. Contemporary research evaluating Mamsa Sara has demonstrated a positive association between Sara status and muscle tone, suggesting that Ayurvedic assessment of tissue excellence may serve as a useful indicator of musculoskeletal health.[3]

Assessment of Mamsa Dhatu:-
Assessment of Mamsa Dhatu in Ayurveda is performed through Sara Pariksha, observation of muscle bulk, firmness, stability, and physical endurance. Modern assessment methods include muscle strength testing, anthropometric measurements, handgrip strength, body composition analysis, and functional performance evaluation. Integrating both approaches may provide a comprehensive assessment of muscular health.

Ayurvedic Physiology of Muscle Nourishment:-

Role of Agni [6]:-

Agni is central to tissue nourishment. Proper digestion and metabolism ensure adequate transformation of food into nutrients capable of nourishing successive Dhatus.

When Agni is balanced:-

- Nutrient absorption improves
- Tissue metabolism becomes efficient
- Muscle development is optimized

Conversely, Mandagni leads to Ama formation, resulting in impaired tissue nourishment and muscle weakness.

Dhatu Poshana Nyaya [7]:-

Ayurveda describes several theories explaining tissue nourishment.

Ksheera-Dadhi Nyaya:-

Just as milk transforms sequentially into curd, butter, and ghee, nutrients transform into successive Dhatus.

Kedari-Kulya Nyaya:-

Nutrients reach tissues sequentially through channels similar to irrigation of fields.

Khale-Kapota Nyaya:-

Different tissues selectively absorb nutrients according to their requirements, resembling pigeons picking grains from a field. These theories collectively explain the selective and sequential nourishment of muscle tissue. The classical theories of Dhatu Poshana have also been interpreted in the light of contemporary biological sciences. The sequential nourishment described by Ksheera-Dadhi Nyaya resembles progressive cellular differentiation, while Kedari-Kulya Nyaya reflects nutrient transport through circulatory pathways. Khale-Kapota Nyaya illustrates selective cellular uptake of nutrients according to tissue requirements. Recent Ayurvedic scholars have correlated these principles with stem cell biology, proposing that tissue regeneration and maintenance occur through highly regulated processes of differentiation, proliferation, and tissue-specific nourishment, concepts remarkably similar to Ayurvedic descriptions of Dhatu formation and replenishment.[8]

Dietary Factors for Muscle Nourishment:-

Brimhana Ahara [9]

Brimhana refers to anabolic and nourishing dietary measures that promote tissue growth.

Foods recommended for Mamsa Dhatu nourishment include:-

- Milk and milk products
- Ghee
- Black gram (Masha)
- Wheat
- Shashtika Shali rice
- Meat soups (Mamsa Rasa)
- Almonds and nuts
- Sesame seeds

These foods possess Guru, Snigdha, and Balya properties that support tissue building.

Protein and Ayurvedic Correlation:-

Modern nutrition identifies protein as the primary nutrient for muscle protein synthesis.[10]

Ayurvedically, protein-rich foods can be correlated with:-

- Brimhana Dravyas
- Balya Ahara
- Dhatuvardhaka substances

Such foods support the formation and maintenance of Mamsa Dhatu through enhanced tissue metabolism.

Lifestyle Measures Supporting Muscle Health:-
Vyayama (Exercise)[11]:-
Regular exercise stimulates muscle development and improves strength.

Charaka advocates exercise for:-
- Enhancement of strength
- Improvement of endurance
- Reduction of excess adiposity
- Promotion of tissue stability

Modern studies demonstrate that resistance training increases muscle protein synthesis and prevents sarcopenia.

Adequate Sleep [12]:-
Nidra is one of the Trayopastambha (three pillars of life).

Proper sleep:-
- Supports anabolic hormone secretion
- Enhances recovery
- Improves muscle repair

Sleep deprivation has been associated with reduced muscle protein synthesis and impaired recovery.

Rasayana and Muscle Nourishment:-
Rasayana therapy promotes tissue regeneration, longevity, and enhanced vitality.

Several Rasayana drugs support muscle nourishment:-
Ashwagandha (Withania somnifera) [13]:-
- Enhances muscle strength
- Improves endurance
- Increases lean body mass

Shatavari (Asparagus racemosus) [14]:-
- Promotes anabolic activity
- Improves nutritional status

Bala (Sida cordifolia) [15]:-
- Traditionally used as a strength-promoting herb
- Supports neuromuscular function

Vidarikanda (Pueraria tuberosa) [16]:-
- Possesses Brimhana and Balya properties
- Supports tissue nourishment

Mamsa Dhatu Kshaya and Clinical Implications [17]:-
Mamsa Dhatu Kshaya may manifest as:-
- Muscle wasting
- Fatigue
- Weakness
- Reduced physical endurance
- Emaciation
- Poor wound healing

These manifestations closely resemble modern conditions such as: [18]:-
- Sarcopenia
- Cachexia
- Protein-energy malnutrition
- Frailty syndrome

Ayurvedic interventions focus on correcting Agni, improving nutrient assimilation, and administering Brimhana and Rasayana therapies.

Mamsa Dhatu and Tissue Regeneration:-

Ayurveda considers Mamsa Dhatu a dynamic tissue undergoing continuous nourishment and renewal through the action of Dhatwagni. Proper transformation of nutrients through successive Dhatus ensures maintenance of muscle mass, strength, and structural integrity. Contemporary interpretations of Dhatu Poshana suggest similarities with cellular metabolism, protein synthesis, tissue remodeling, and regenerative processes mediated by progenitor and stem cells. This conceptual overlap highlights the relevance of Ayurvedic physiology in understanding modern mechanisms of muscle growth, repair, and regeneration. [8,19]

Integrative Perspective:-

Modern muscle nutrition focuses on:-

- Protein intake
- Essential amino acids
- Micronutrients
- Resistance exercise

Ayurveda complements these concepts by emphasizing:-

- Digestive efficiency (Agni)
- Tissue-specific metabolism (Dhatwagni)
- Nutrient transport (Srotas)
- Lifestyle regulation
- Rejuvenation therapies (Rasayana)

An integrative approach may provide superior outcomes in muscle preservation, rehabilitation, aging populations, and chronic disease management.The Ayurvedic assessment of Mamsa Sara may provide a practical framework for evaluating muscle quality beyond simple anthropometric measurements. Characteristics such as firmness, endurance, stability, and physical performance closely parallel modern indicators including muscle tone, muscle strength, lean body mass, and functional capacity. Integrating Sara Pariksha with modern musculoskeletal assessment tools may enhance individualized nutritional and rehabilitative strategies.[3]

Table 1. Correlation of Mamsa Dhatu with Modern Muscle Physiology

Ayurvedic Concept	Modern Correlation
Mamsa Dhatu	Skeletal muscle tissue
Mamsagni	Cellular metabolism
Dhatu Poshana	Nutrient transport and utilization
Brimhana	Anabolism
Bala	Muscle strength
Mamsa Kshaya	Sarcopenia/Muscle wasting
Rasayana	Regeneration and recovery

Although Ayurvedic concepts of Mamsa Dhatu provide a comprehensive framework for understanding muscle nourishment, direct scientific validation of many classical concepts remains limited. Further clinical, biochemical, and translational studies are required to establish stronger correlations between Ayurvedic principles and modern muscle physiology.

Conclusion:-

Ayurveda presents a comprehensive and holistic understanding of muscle nourishment through the interconnected concepts of Mamsa Dhatu, Agni, Dhatu Poshana, and Rasayana. According to Ayurvedic physiology, optimal muscle health depends not only on adequate nutritional intake but also on efficient digestion, proper tissue metabolism, effective nutrient transport, and a balanced lifestyle. The principles of Brimhana, Balya, and Rasayana offer valuable therapeutic strategies for promoting muscle growth, strength, endurance, recovery, and healthy aging. The concept of Mamsa Dhatu extends beyond the structural aspect of muscle tissue and encompasses functional

attributes such as strength, stability, endurance, and physical resilience. Classical concepts including Mamsa Sara and Dhatu Poshana Nyaya provide a unique framework for understanding muscle quality, tissue nourishment, and regeneration. Contemporary interpretations of these principles reveal meaningful parallels with modern concepts of muscle metabolism, tissue remodeling, and regenerative biology.An integrative approach combining Ayurvedic wisdom with contemporary nutritional and physiological sciences may enhance strategies for the prevention and management of muscle-related disorders, rehabilitation, sports performance, and geriatric care. Further interdisciplinary research is warranted to scientifically validate these traditional concepts and explore their potential applications in personalized healthcare and muscle health optimization.

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