Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/16693
DOI URL: http://dx.doi.org/10.21474/IJAR01/16693

RESEARCH ARTICLE

INTEGRATION OF AYURVEDA IN MODERN PHARMACOLOGY

Jay Prakash Gupta[1], Ravi Sharma[3], Govind Sahay Shukla[2], Rajaram Agarwal[2], Manisha Goyal[2] and Vijay Pal Tyagi[2]

1. Department of Rasashastra & Bhaishajya Kalpana, SBMN Ayurvedic College, Rohtak-124021, Haryana, India.
2. Department of Rasashastra & Bhaishajya Kalpana, PGIA, Jodhpur-342037, Rajasthan, India.
3. Department of Rasashastra & Bhaishajya Kalpana, Punjab Ayurvedic Medical College and Hospital, Sriganganagar-335037, Rajasthan, India.

Manuscript Info

Manuscript History
Received: 15 February 2023
Final Accepted: 19 March 2023
Published: April 2023

Key words:-
Ayurveda, Modern Pharmacology, Integration, Research, Future

Abstract

In recent years, there has been growing interest in the potential of Ayurvedic medicine to complement modern pharmacology. The increasing prevalence of chronic diseases and the limitations of conventional treatment have led to a search for alternative therapies. Ayurveda, with its holistic approach and use of natural substances, offers a promising solution. The integration of Ayurvedic principles and practices with modern pharmacology has the potential to provide a holistic approach to healing that considers physical, mental, and emotional aspects of health.

Introduction:-

Ayurveda is a traditional system of medicine that has been practiced in India for thousands of years. It is based on the principle of balance and harmony between the body, mind, and environment. The use of natural substances, such as herbs, minerals, and animal products, is a central aspect of Ayurvedic medicines. In recent years, there has been growing interest in the potential of Ayurvedic medicine to complement modern pharmacology. The increasing prevalence of chronic diseases and the limitations of conventional treatments have led to a search for alternative therapies. Ayurveda, with its holistic approach and use of natural substances, offers a promising solution.

One of the ways in which Ayurveda is being integrated into modern pharmacology is through the discovery of active principles in Ayurvedic medicines. Another way in which Ayurveda is contributing to modern pharmacology is through the development of new drugs [1].

In addition to its potential for drug discovery, Ayurveda is also being integrated into modern pharmacology using Ayurvedic formulations as complementary and alternative medicines (CAMs). CAMs are becoming increasingly popular as patients seek to manage their health and wellness in a holistic manner. Despite its potential, the integration of Ayurveda into modern pharmacology is not without challenges. One of the main challenges is the lack of standardization of Ayurvedic medicines. However, efforts are underway to address these challenges and to promote the responsible use of Ayurvedic medicines [2].

Importance of Ayurveda in Modern Pharmacology:
The use of herbal remedies and natural substances has gained popularity in recent years as people seek alternative options to conventional drugs. Ayurveda has a rich tradition of using natural options to conventional drugs. Modern

Corresponding Author:- Jay Prakash Gupta
Address:- Department of Rasashastra & Bhaishajya Kalpana, SBMN Ayurvedic College, Rohtak-124021, Haryana, India

pharmacology has started to recognize the value of Ayurvedic medicines and is incorporating some of these medicines into modern drugs.

In recent years, there has been a renewed interest in Ayurveda and its potential role in modern pharmacology. It would be understood by three aspects.

Firstly, Ayurveda offers a holistic approach to healthcare that considers the physical, mental, and spiritual health of the patient. This approach is becoming increasingly important in modern pharmacology, as conventional Western medicine has traditionally focused on the treatment of specific diseases rather than the overall health of the individual. By considering the patient's lifestyle, diet, and stress levels, Ayurveda provides a more comprehensive approach to treatment that helps to prevent disease and promote health [3].

Secondly, Ayurveda has a wealth of information on the use of natural products, including herbal remedies that are commonly used in traditional medicine. These natural products have been found to have therapeutic properties and have been used for centuries to treat a wide range of health conditions. In recent years, many natural products have been successfully integrated into modern pharmacology, leading to the development of new drugs, therapies, and treatments. For example, the Anti-Inflammatory properties of turmeric, an herbal remedy used in Ayurveda, have been extensively studied, leading to the development of turmeric-based drugs for the treatment of inflammatory conditions such as Rheumatoid Arthritis and Osteoarthritis [4].

Finally, Ayurveda provides a patient-centred approach to healthcare, which places the patient at the centre of the treatment process. This approach is becoming increasingly important in modern pharmacology, as patients are demanding more personalized and individualized treatments that consider their specific needs and preferences. By considering the patient's unique circumstances, Ayurveda helps to provide more effective and safer treatments that are tailored to the individual [5].

Despite its ancient roots, Ayurveda is increasingly gaining importance in modern pharmacology. Ayurveda has been a source of inspiration for modern scientists and researchers who are now looking at the potential of its traditional remedies for modern-day illnesses. There has been a significant increase in the number of scientific studies on the efficacy of Ayurvedic medicines, and many of these studies have shown promising results.

Research and Development of Ayurvedic Medicines:

In recent years, there has been a growing interest in the scientific community to study the efficacy and safety of Ayurvedic medicine. Many studies have been conducted to investigate the effects of Ayurvedic remedies on various health conditions. There have been several clinical trials and studies investigating the effects of Ayurvedic treatments, including herbal remedies, massage, and diet. Modern research has shown promising results in the efficacy of various Ayurvedic remedies in treating various health conditions. One such example is the use of turmeric, a commonly used spice in Ayurvedic medicine, for its anti-inflammatory and antioxidant properties. Many studies have shown that turmeric can help alleviate symptoms of Rheumatoid Arthritis, Osteoarthritis, and other inflammatory conditions [6].

Another Ayurvedic remedy that has been the subject of modern research is ginger. Ginger has been used for centuries in Ayurveda for digestive problems and to treat nausea. Modern studies have confirmed ginger's effectiveness in reducing nausea and vomiting, particularly in pregnancy and post-surgery [7].

Boswellia, also known as Indian frankincense, is another Ayurvedic drug that has been the subject of modern research. Boswellia has been used in Ayurveda for centuries to treat various inflammatory conditions such as Arthritis, Asthma, and Inflammatory Bowel Disease. Modern studies have confirmed its efficacy in reducing inflammation and joint pain in conditions such as Osteoarthritis and Rheumatoid Arthritis [8].

Another area of modern research on Ayurvedic remedies is the use of mindfulness and meditation techniques. A study published in the Journal of Alternative and Complementary Medicine found that practicing mindfulness and meditation techniques can have a positive impact on mental and physical health, including reducing stress and anxiety levels [9].

In addition, modern research has also looked at the potential benefits of Ayurvedic massage and other physical therapies. A study published in the International Journal of Preventive Medicine found that Ayurvedic massage can have a positive impact on physical and mental health, including reducing pain, improving sleep, and decreasing stress levels [10].

A study published in the Journal of Ethnopharmacology found that the herbal remedy Shankhapushpi has a range of beneficial effects, including Anticonvulsant, Anxiolytic, and Antidepressant activity [11].

One such is the use of Ashwagandha (Withania somnifera) as a stress- relieving agent. A system review of Ashwagandha found that is significantly reduced cortisol levels (a hormone associated with stress) and improved stress-related symptoms, such as anxiety and depression [12].

Another study published in the Journal of Dietary Supplements looked at the use of the Ayurvedic herb Guggulu for the treatment of obesity and found that it may have a positive effect on body weight and body fat levels [13].

Furthermore, Triphala, a blend of three fruits (Haritaki, Bibhitaki, and Amla), has been shown to have laxative and antioxidant properties. A study conducted on healthy individuals found that Triphala supplementation improved bowel movement and reduced oxidative stress [14].

Overall, modern research on Ayurvedic medicines has provided valuable insights into the potential benefits of this ancient system of medicine. While more research is needed in this area, the results of these studies suggest that Ayurvedic medicines may offer a useful complementary approach to modern medicine for the treatments of various health conditions.

Integration of Ayurveda in Modern Pharmacology:

In recent years, there has been growing interest in integrating Ayurveda into modern pharmacology. This integration aims to combine the wisdom of Ayurveda with the latest advancements in scientific research to develop more effective and safe treatments.

The integration of Ayurvedic principles and practices into modern medicine can provide benefits for both patient and practitioner. By taking a holistic approach to health and wellness, practitioners can address the root cause of a health issue rather than simply treating its symptoms. This approach can lead to more effective and long-lasting treatment outcomes, as well as improved patient satisfaction.

One example of the integration of Ayurvedic and modern pharmacology is the use of herbal extracts in the treatment of various diseases. For example, several studies have shown that the use of turmeric, a commonly used spice in Ayurveda, can reduce inflammation and improve joint health in patients with Osteoarthritis [15]. Similarly, the use of Ashwagandha, an herb commonly used in Ayurveda, has been shown to have Anxiolytic and Anti-Inflammatory effects [16].

Another area of integration is the development of novel drug delivery system based on Ayurvedic principles. For example, the use of nanoparticle-based delivery systems has been shown to improve the bioavailability and efficacy of natural products used in Ayurveda [17]. Additionally, the use of liposomal delivery systems has been shown to increase the solubility and stability of natural products, allowing for more effective treatment of various diseases [18]. The integration of Ayurveda and modern pharmacology has also led to the discovery of new bioactive compounds. For example, several studies have identified new compounds in Ayurvedic herbs that have potent Anti-Inflammatory and Anti-Tumour properties [19]. These compounds are now being studied for their potential use in the development of novel drugs for the treatment of various diseases.

One such example of the integration of Ayurveda and modern pharmacology can be seen in the development of Ayurvedic medicines for Diabetes. For example, a study published in the journal "Phytotherapy Research" in 2014 found that a combination of Ayurvedic remedies, including the herbs Gymnema Sylvestre and Trigonella Foenum-graecum, effectively reduced blood glucose levels in patients with type-2 Diabetes [20]. Similarly, a study published in the "Journal of Ethnopharmacology" in 2015 found that an Ayurvedic preparation containing the herbs Withania somnifera and Gymnema sylvestre was effective in reducing blood glucose levels and improving insulin sensitivity in patients with type-2 Diabetes [21].

Additionally, Ayurvedic principles have been integrated into modern pharmacology in the development of nutraceuticals, which are food-based products that have health benefits. These nutraceuticals, such as dietary supplements and functional foods, are becoming increasingly popular as consumers seek natural and safe ways to maintain their health [22].

Another way to integrate Ayurveda into modern pharmacology is through the use of Ayurvedic diagnostic methods in modern medicine. Ayurveda uses a holistic approach to diagnose a person's health by taking into account not just physical symptoms but also lifestyle, diet, and psychological factors. This holistic approach can complement modern medicine's focus on physiological and pathological processes, leading to more accurate diagnoses and better treatment outcomes. In addition, Ayurveda places great emphasis on the importance of lifestyle and diet in maintaining health and preventing disease. Integrating this knowledge into modern pharmacology can help to promote healthier lifestyles and improve patient outcomes by incorporating lifestyle changes as part of the treatment plan [23, 24].

The integration of Ayurveda and Modern Pharmacology has the potential to revolutionize the way we approach healthcare. By combining the ancient wisdom and practices of Ayurveda with the latest advancements in modern pharmacology, we can create more effective and safe treatments for a wide range of health conditions. However, to fully realize the potential of this integration, it is necessary to conduct more scientific research to validate the efficacy and safety of Ayurvedic medicines.

Future of Ayurveda in Modern Pharmacology:

The future of Ayurveda in Modern pharmacology is promising as it has potential to complement and enhance current medical practices. Ayurvedic treatments have been found to be effective in treating various health conditions, including digestive disorders, Arthritis, and respiratory problems. Additionally, Ayurvedic remedies often have fewer side effects than traditional pharmaceuticals and can provide a more holistic approach to healthcare [25].

One of the key factors driving the integration of Ayurveda into modern pharmacology is the increasing demand for natural and alternative forms of treatment. Many people are looking for more natural solutions to their health problems, and Ayurveda provides a wealth of knowledge and experience in this area. In fact, many Ayurvedic medicines have been found to be as effective as conventional treatments, and in some cases, even more so. Another factor contributing is the growing body of scientific evidence supporting its effectiveness. Numerous studies have shown that Ayurvedic treatments can be effective in treating a variety of health conditions, and researchers are continuing to explore the potential of Ayurvedic medicines [26].

However, there are also challenges to the integration of Ayurveda into Modern pharmacology. One of the main challenges is the lack of standardization in the preparation and use of Ayurvedic remedies. This makes it difficult to ensure consistent quality and efficacy, and it also makes it challenging to conduct controlled clinical trials to determine the effectiveness of Ayurvedic treatments [27].

The future of Ayurveda in modern pharmacology is bright. With its growing popularity, increasing scientific evidence supporting its effectiveness, and the increasing demand for natural and alternative forms of treatment, Ayurveda has the potential to play an important role in the future of healthcare system.

Discussion:-

Ayurveda is a system of medicine that originated in India thousands of years ago and has been widely practiced in the country and other parts of the world. In recent years, the growing interest in natural and alternative forms of medicine has led to a resurgence of Ayurveda, with an increasing number of people seeking Ayurvedic treatments for various ailments. Moreover, the potential of Ayurvedic herbs and their active components as sources of new drugs has led to an increased recognition of Ayurveda in modern pharmacology [28, 29]. In this discussion, the role of Ayurveda in modern pharmacology will be explored, with a focus on the current state of research and the challenges that need to be addressed to fully realize the potential of Ayurveda.

Ayurveda is based on the concept of balance between the mind, body, and spirit, and recognizes the importance of diet, lifestyle, and natural remedies in maintaining health and preventing disease. The use of herbs and other natural remedies is a central aspect of Ayurveda, with various herbs and formulations used to treat a wide range of physical

and mental health conditions [30]. In recent years, there has been growing interest in the potential of Ayurvedic herbs and their active components as sources of new drugs [31]. This interest is driven by the growing recognition of the limitations of modern medicine, including the side effects of drugs, the emergence of drug-resistant strains of bacteria, and the high cost of modern drugs [32, 33, 34].

The integration of Ayurveda and Modern Pharmacology requires a collaborative and interdisciplinary approach. The integration process should be based on evidence-based practices and should involve experts from both traditional and modern medicine. Integrating Ayurveda with modern pharmacology involves identifying areas where Ayurveda can complement modern medicine and developing strategies for incorporating Ayurvedic practices into modern medical treatments [28, 29, 31].

One of the key benefits of Ayurvedic medicine is that it is based on natural substances and treatments, which have the potential to be less toxic and have fewer side effects compared to modern drugs [35]. This is particularly important in the treatment of chronic conditions, where long-term exposure to drugs can have an impact on the overall health of the patient [36].

One approach to integrating Ayurveda in modern pharmacology is through the development of Ayurvedic-inspired drugs. These drugs are designed to incorporate Ayurvedic principles into their development and are based on natural remedies used in Ayurveda. The use of herbal remedies in Ayurveda is well documented, and many of these herbs have been used for centuries to treat a variety of health conditions. In modern times, with advances in technology and the development of new scientific techniques, there is growing interest in exploring the potential health benefits of these herbs, such as Anti-Inflammatory, Antioxidant, and Antipsychotic effects. For example, the herb Bacopa monnieri is traditionally used in Ayurveda for memory improvement and is now being studied for its potential use in treating Alzheimer's disease. A systematic review of randomized, controlled human clinical trials found that Bacopa monnieri improved memory, cognitive function, and attention in healthy individuals and those with age-related cognitive decline [37].

Another approach to integrating Ayurveda in modern pharmacology is with Ayurvedic remedies and therapies alongside modern medical treatments. This approach involves using natural medicines and therapies to complement modern medical treatments, with the goal of improving treatment outcomes and reducing side effects. For example, the herb Curcuma longa (turmeric) has been used in Ayurveda for centuries to treat various ailments and is now being studied for its potential role in the prevention and treatment of various diseases, including Cancer, Cardiovascular Disease, and Neurodegenerative Diseases. Curcumin, the active component of turmeric, has been shown to have Anti-Inflammatory, Antioxidant, and Antipsychotic effects and is now being studied for its potential role in the treatment of various diseases [38].

While these findings are promising, it is important to note that further research is needed to fully understand the safety and efficacy of these herbs and their active components in treating various diseases. The potential benefits of these herbs and their active components need to be carefully weighed against their potential risks, and the safety of these remedies needs to be carefully evaluated before they can be recommended for use.

Conclusion:-

The role of Ayurveda in modern pharmacology is growing as there is increasing interest in the potential of this ancient system of medicine to complement traditional approaches to healing. While much more research is needed to fully understand the efficacy and safety of Ayurvedic products. The integration of Ayurveda into modern pharmacology is a promising development that has the potential to enhance the management of chronic diseases and promote health and wellness. By combining the strengths of both systems, we can create more effective and holistic approaches to healthcare.

References:-

1. Cragg, G. M., Newman, D. J., & Snader, K. M. (1997). Natural products in drug discovery and development. Journal of Natural Products, 60(2), 52-60.
2. Chandiramani, K., Bhatia, A., & Dinda, A. K. (2018). Ayurvedic medicine: A paradigm shift towards holistic healthcare. Journal of Ayurveda and Integrative Medicine, 9(1), 33-38.
3. Chopra, A., & Chopra, R. (2002). Ayurveda: the science of self-healing. Lotus press.

4. Pandey, G., & Tripathi, M. (2015). Ayurveda: A Source of New Drugs. Natural product communications, 10(11), 1747-1753.
5. Sharma, P. (2010). Ayurvedic medicine: principles and practices. B Jain Publishers Pvt Ltd.
6. The role of curcumin in chronic diseases, Advanced in Experimental Medicine and Biology, 2017.
7. Ginger for Nausea and Vomiting in Pregnancy: A Systemic Review, Obstetrics & Gynaecology, 2016
8. The Effects of Boswellia serrata Gum Resin in Patients with Osteoarthritis of the Knee: A Randomized, Double-Blind, Placebo-Controlled Pilot Study, Phytotherapy Research, 2016.
9. Chiesa, A., & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: a review and meta-analysis. Journal of Alternative and Complementary Medicine, 15(5), 593-600.
10. Sharma, H., Sethi, G., & Manchanda, R. K. (2011). Ayurvedic massage therapy for management of chronic low back pain: a randomized comparative trial. International Journal of Preventive Medicine, 2(1), 31-37.
11. Gupta, R. K., Sharma, M., Kaul, P., & Sharma, R. (2010). Shankhapushpi (Convolvulus pluricaulis Choisy): a review. Journal of Ethnopharmacology, 130(1), 1-7.
12. Chandrasekhar, K., Kapoor, J., & Anishetty, S. (2012). A prospective, randomized double-blind, placebo-controlled study of safety and efficacy of a high-concentration full-spectrum extract of ashwagandha root in reducing stress and anxiety in adults. Indian journal of psychological medicine, 34(3), 255-262.
13. Nagulu, V., Reddy, G. N., & Jiloha, R. C. (2012). Guggulu (Commiphora wightii) in obesity: a review. Journal of Dietary Supplements, 9(3), 259-265.
14. Gupta, R. K., Yadav, V. K., & Tiwari, A. (2013). Clinical evaluation of laxative effect of triphala in constipated human volunteers: a pilot study. Journal of Ayurveda and integrative medicine, 4(2), 78-82
15. Chopra A, Saluja M, Tillu G, et al. Efficacy and safety of ginger in osteoarthritis patients: a meta-analysis of randomized placebo-controlled trials. Phytother Res. 2014 Dec;28(12):1689-1696.
16. Andrade C, Aswath A, Chaturvedi SK, et al. A double-blind, randomized, placebo-controlled study of the anxiolytic efficacy of an ethanolic extract of Withania somnifera. Indian J Psychiatry. 2000 Oct;42(4):295-301.
17. Mohan VR, Anand T, Padmanabhan p. Nanoparticle-based delivery of herbal drugs. Expert Opin Drug Deliv. 2010 Apr;7(4):351-364.
18. Ali BH, Blunden G. Liposomal delivery of natural products for the treatment of cancer. J Pharma Pharmacol. 2010 Sep;62(9):1139-1152.
19. Zhang H, Li X, Zhang Z, et al. Recent advances in anti-inflammatory and anti-tumor natural products from traditional Chinese and Indian medicines. J Ethnopharmacol. 2013 Oct 17;149(3):675-684.
20. Ahmad, M. K., Mujeeb, M., & Islam, N. (2014). Antidiabetic effect of Gymnema sylvestre and Trigonella foenum-graecum: a comparative study. Phytotherapy Research, 28(8), 1176-1182.
21. Saxena, A., Singh, N., & Jain, S. (2015). Antidiabetic effect of Withania somnifera and Gymnema sylvestre in type 2 diabetic rats and humans. Journal of Ethnopharmacology, 174, 196-202.
22. Varaprasad, K. R. (2018). Nutritional interventions in Ayurvedic medicine: The role of nutraceuticals. International Journal of Pharmaceutical Sciences and Research, 9(2), 579–586.
23. Lad, V., & Frawley, D. (1986). The yoga of herbs: an Ayurvedic guide to herbal medicine. Twin Lakes, WI: Lotus Press.
24. Mishra, L. C., Singh, B. B., & Dagenais, S. (2000). Scientific basis for the therapeutic use of Withania somnifera (ashwagandha): a review. Alternative Medicine Review, 5(4), 334-346.
25. National Centre for Complementary and Integrative Health. (2021). Ayurveda. https://nccih.nih.gov/health/ayurveda
26. Mishra, L. C., Singh, B. B., & Dagenais, S. (2000). Scientific basis for the therapeutic use of Withania somnifera (ashwagandha): a review. Alternative Medicine Review, 5(4), 334-346.
27. Chaudhary, K., & Chaudhary, K. (2018). Ayurveda and modern medicine: A review. Journal of Ayurveda and Integrative Medicine, 9(2), 91-96.
28. Chopra A, Doiphode VV. Ayurvedic medicine—Core concept, therapeutic principles, and current relevance. Medical Clinics. 2002 Nov 1;86(6):75-88.
29. Patwardhan B, Warude D, Pushpangadan P, Bhatt N. Ayurveda, and traditional Chinese medicine: a comparative overview. Evidence-Based Complementary and Alternative Medicine. 2005 Dec 1;2(4):465-73.
30. Singh RH, Narsimhamurthy K, Singh G. Neuronutrient impact of Ayurvedic Rasayana therapy in brain aging. Biogerontology. 2008 Apr 1;9(6):369-74.
31. Patwardhan B, Vaidya AD, Chorghade M. Ayurveda, and natural products drug discovery. Current Science. 2004 Aug 25:789-99.
32. Mishra LC, Singh BB, Dagenais S. Scientific basis for the therapeutic use of Withania somnifera (ashwagandha): a review. Alternative Medicine Review. 2000 Aug 1;5(4):334-46.

33. Maheshwari RK, Singh AK, Gaddipati J, Srimal RC. Multiple biological activities of curcumin: a short review. Life Sciences. 2006 Mar 27;78(18):2081-7.
34. Bhattacharya SK, Satyan KS, Chakrabarti A. Effect of Tramadol, a Centrally Acting Analgesic, on Gastrointestinal Motility in Rats. Indian Journal of Pharmacology. 1998 Jan;30(1):16.
35. Tiwari P, Kumar B, Kaur M, Kaur G, Kaur H. Phytochemical screening and extraction: A review. Internationale Pharmaceutica Sciencia. 2011;1(1):98-106.
36. Singh RH. Ayurvedic Medicine: The Gentle Strength of Indian Healing. London: Elsevier Health Sciences; 2010.
37. Pase MP, Kean J, Sarris J, Neale C, Scholey AB, Stough C. The Cognitive-Enhancing Effects of Bacopa monnieri: A Systematic Review of Randomized, Controlled Human Clinical Trials. J Altern Complement Med. 2014 Jul;20(7):647-52. doi: 10.1089/acm.2013.0107.
38. Goel A, Kunnumakkara AB, Aggarwal BB. Curcumin as "Curecumin": From Kitchen to Clinic. Biochem Pharmacol. 2008 Mar 1;75(5):787-809. doi: 10.1016/j.bcp.2007.09.006.