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Potential Of Marine Biomolecules As The Promising Life-Style Drugs

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Abstract:

The lifestyle drugs are the modern pharmaceutical innovations. They are Pharmacoeconomics assets of the 21st century. A new term QOL (quality oriented life improving drugs) has augmented their prospective potential. Marine biomolecules offered novel chemical entities (NCEs) of polypharmacophoric bioactions for improving the style and quality of life. The antidepressive, cosmeceutical, and aphrodisiacal potentials of marine novel chemical entities were explored in this study.

1.Introduction

The life style drugs⁷⁻⁸ are the modern pharmaceutical innovations. They are 21st century Pharmacoeconomics assets^{9, 10}. The precise definition of lifestyle drug is still a subject of debate. About twenty three different definitions are available in scientific literature^{1-8,11}. Some of them are quoted here:

- According to Gilber et al: Drugs that are used to treat either non-health problems that are life style drugs and not medical necessities of health problems that might be better treated by a change of life style.
- According to Herald Tribune: Drugs that don't necessarily cure illness but can be used to improve daily life by boosting psychological attitudes, energy levels, sexual performance and body image.
- According to business week: Drugs that are not for severely impaired diseases but for improving quality of life. The life style drugs are the pharmaceuticals that are prescribed as the drugs for the purpose of enhancing the wellness and improving the "desired" quality of life of a person rather than alleviating or curing life threatening disease.
- According to Hearth and lines: Pharmaceuticals which are taken in order to attain a certain psychosocial beauty and handsomeness to stabilize the body's vital function.
- According to recent definition^{12, 13}: Life style drug is the medication which enriches the individual with favourable life by improving the systems which are not morbid. They may have a critical influence on the sustainability of current health system. A new term QOL (quality oriented life improving drugs), has recently been introduced and it includes hormone replacement therapy, antidepressants and antiobestics etc.

The coming up of the life style drugs is related to the problems of modern life scenario. The subjective qualities of the human life have created serious health hazards. The technocratic stresses, depressions, and pressures have made human life miserable. The competitive urges materialistic races and martial maladies create massive negative outcomes. The life style medications¹⁴ are non- prescriptional drugs and allowed consumers to find alternatives of self gratifications. The ideal qualifications¹⁵ of a lifestyle drug are:

- Non-life threatening
- Non-pathologizing to the normal status of the human body
- Non painful, non –addictive
- Recreational
- Enhancer of longevity and worldly pleasures
- Elevator of self-esteem
- Non-controversial
- Should not be misleading through false claims/advertising
- Should not have allopathic ingredients (e.g. anabolic steroids)
- Must modify or change non-medical related objective
- Should have an optimal margin of safety
- Diseases mongering character should be absent
- Elevate the potential of well-being and positive mental attitudes
- They should not only alter the appearance but also the physical and mental capabilities
- Holistic response of an individual is essential.

In short, they provide a certain degree of psychosocial intelligence, boost positive psychological attitudes and enhanced energy levels in daily life.

There are four categories of reported life style drugs¹⁵.

- Image and look: They are related to wrinkles, hair loss, facial, makeup, and increase in muscle mass and height
- Quality of life improvement: Incontinence, impotence and influenza come in this category.
- Lifestyle: Postpone menstruation, smoking cessation, contraception, weight control and sun-protection belong to this class.
- Psychological: Anti-depression, obsessive-compulsive-disorder, social anxiety are members of this class
- Marine biomolecules¹⁶⁻¹⁹ have remarkable potential and promising prospective value for the research and development of lifestyle drugs. This study explored three categories
 - Marine cosmetics : for look and image
 - Marine antidepressants: for psychological boosting of mood creativity
 - Marine aphrodisiacs for quality of life and style.

2.Theoretical Methodology

Marine natural products are the treasure of pharmaceuticals because they represent novel chemical entities, derived from the marine organisms. The potential of marine biomolecules as the life style drugs is interpreted below:

2.1.Antidepressive Marine (AMBS)²⁰⁻²³ Biomolecules

Depression is a mood swinger. The feelings become despond and gloomy. The impaired esteem, fear of recurrances, interpersonal difficulties involving marriage and parenting, having not enough money, fatigue, poor concentration and sleep disturbance make depression insidious. The antidepressive nutraceuticals yielded few AMBs. They are Marine Phytoplankton: It is a single celled plants and responsible for making 90% of the earth's oxygen. It became nutritional superfood in 2005 as it promotes 98% absorption of its essential amino-acids vitamins, minerals and glycol-nutrients. Frankincense: - is a white milky resin produced by Genus *Boswellia*. During ancient times it was considered more valuable than gold. Its pure essential oil selling for a dollar a drop on the streets. It is the "mother" of all essential oils. Throughout history, frankincense has been used to treat and or prevent various chronic disorders (Arthritis Cancer) etc. The chemical nature is still not well known, but indigenous qualities are tonic cell renewal and mood elevation (antidepressant) gave a promising status of the life style drug in recent years.

"Frequensea" energizes cell and has all the building materials for cellular rejuvenation. It contains full spectrum of vitamins, 72 ionic trace minerals, aminoacids, enzymes and much more. Recently it has been claimed that it appears to have anti-inflammatory, anti-allergic, anti-oxidant, and anti –depressive activities.

2.2.Cosmeceutical Marine Biomolecules (CMBS)²⁴⁻²⁹

Marine organisms have remarkable potential and promising prospective value for the research and development of Cosmeceuticals. Nanoparticles of marine compounds are well suited for the dispersion in water because of their superior stability. Their cores can have a variety of different lipophilic agents, which have a high affinity to the epidermis and their good penetrability into the top layers of the stratum corneum. The net advantage of nano particles is that the concentration of active compounds in the epidermis is enhanced. It led to conclude that the biomass nanoparticles containing marine ingredients are an ideal delivery system for topical application in cosmetical technology. The sources of nanoparticles are marine algae and fungi. Recently the properties of bioactive seaweeds and algae are utilized in cosmetics. Algae polysaccharide derivatives have high gelling, bonding and viscosity increasing capabilities for the cosmetical applications. The pharmaceutical companies exploited the multiple benefits of algae and seaweeds. Some of them are:-

- Algae *Laminaria* Genus has strong sebum regulating properties.
- *Chondrus crispus* is a carrageen moss which is a source of sulphated polysaccharides and also acts on sebaceous functions
- *Rodymenia palmata* is red seaweed and an excellent source of Vitamins with anti-sudorific actions.

- Ulva Lactuca (sea lettuce) has anti-inflammatory and anti-oxidant properties. It also stimulates the production of collagen and elastin.

An amazing product “forever young” which is derived from marine nutrients enhances collagen production and elastin. The tablets of this formulation is derived from sea cucumber, which is composed of:-

- Glycosaminoglycans (GAGs) special marine concentrate made of 50% carbohydrates, 30% protein, 0.5% fat.
- Chondroitin Sulphate.
- Vitamins A, C, D₃, E, thiamine riboflavin niacin, calcium, iron, magnesium and zinc.
- Silica.
- Lutein (Xanthophyll)
- Zeaxanthin
- Cryptoxanthin
- Acerola fruit
- Sea cucumber extract
- Rice protein Isolate

This product as its name says keeps one young forever.

SeaCol™ is a native (non hydrolysed), high molecular weight Type-I Collagen derived from an Australian marine Invertebrate. It is a highly purified 1% collagen solution which retains the properties attributed to the triple helical chemical structure of the native collagen molecule, excellent water, binding ability. It is thus suitable for use in cosmetic applications to promote facial skin hydration and suppleness when applied. In the year 2000 products from Dead Sea were developed by combining rejuvenating minerals with aromatic oils and plant extracts. This combination has skin toner and refreshing qualities.

2.3. Marine Aphrodisiacal Biomolecules (MABS)³⁰⁻³⁴

The marine organisms have life prolonging and health supporting biomolecules. Their traditional medical values have anti-ageing and longevity promoting efficacies which justify aphrodisiacal attenuation of life improvement and style boosting at psychosocial level. Categorizing of the marine aphrodisiacs includes oysters, Irish moss, bioactive marine organisms and algae.

Oysters- They are potent aphrodisiac and nutritional food. They are an excellent source of vitamins A, B₁, B₂, B₃, C and D. They contain high levels of zinc and recommended dietary allowance (RDA) of iron, copper, iodine, magnesium, calcium, manganese and phosphorus. The cholesterol content of oysters is quite low.

Zinc is present in sperm and men lose 1-3 mg zinc per ejaculation. It is good for blood circulation and boosts the immune system. Chemically, oysters are rich in rare amino acids D-aspartic and N-methyl-D-aspartate (NMDA). They trigger a chain reaction of hormones that ended with the production of testosterone in males and progesterone in females.. Their increased levels in blood circulation create sexual activism.

Irish moss- It is a seaweed found in the Atlantic Sea with unusual chemicals of aphrodisiac value. Irish moss is biologically chondrus and is rich in carageenan (water soluble fiber) with immunomodulatory activity. Particularly, this is the best source of iodine, sulphur and selenium. Irish moss is an ocean vegetable, loaded with rare sugar e.g. D-fucose. It also contains oxylepins that affect eicosanoids and prostaglandins. Male' erection involves the prostaglandins therefore Irish moss is medically useful for erectile dysfunction.

Bioactive marine organisms- They are health food and traditionally used as the folk-medicines. They are sea slug (Discodoris), sea worm (Eunice), sea cucumber (Stichopus).

Sea Slug (Discodoris sp)- The crude extract of this organism has steroidal compounds having androgenic activities of testosterone and progesterone.

Sea worm (Eunice sp)- Sea worm also has steroids that stimulate the development of secondary sexual organs and improve absorption of nitrogen compounds for growth enhancement. It promotes strength and prolongs life.

Sea cucumber (Stichopus sp)-It has health maintainer and beauty enhancer qualities which indirectly influence the aphrodisiac action.

Marine Algae (gelidiopsis)- It showed antioxidant activity and anti-ageing effect.

3. Discussion and Result

The potential of marine biomolecules as life-style drugs has futuristic value for the development of novel therapeutical entities.

3.1. AMBs²⁰⁻²³

They have fused ring system of indole and imidazoline heterocyclics with additional groupings like cyclohexenyl, ethylenic unsaturation and N-methyl groups. Their chemical sharing of the indole ring with 5-HT relates to anti-depressive action. The aliphatic and acyclic unsaturation are novel structural features. The presence of oxo and methyl groups may be providing the extension of binding sites. Marine invertebrates have high levels of free amino acids having antidepressive nutraceutical value. They can take care of mild and moderate depression. AMBs have special benefits in liver and bioenergetic related depressive symptoms. The liver plays an important role in depressive threshold. The pathological degeneration of hip-artists through recreational drugs e.g. alcohol cause depression. Phytoplankton has phytonutrients of nutraceutical values. They support the liver, immune system, nerves and provide energy. The healthy liver promotes anti- depressive mood. Human mood fluctuates through psychosocial acumens, Influencing bioenergetic reserves. Recently the concept of “energy medicine (acugenics) related energy status of human body with depression.

Each organ /gland needs vital biochemicals for regulating electric like flow of bioenergy “ Frequensea” biomolecule has inherent bioenergetic quality. It sustains high energy all day long. Frequensea and phytoplankton have great potential for improving the impaired psychosocial profile, causing depression due to personal emotional or social losses by renewal energy profile and mood elevation.

3.2. *CMBS*²⁴⁻²⁹

The cosmetic manufacturers are making a selection of marine products for enhancing the facial look by marine algae powders. Dehydrated skin is irritable, rough and abrasive, promotes wrinkles and facial lines. The lack suppleness gives the feelings of discomfort. Dry skin speeds up facial aging mechanism. The marine based cosmetic moisturizing product restores and strengthens the skin's natural hydration process. Facial beauty is taken care by soft, supple and moisturized skin. An amazing product “Forever Young” has ingredients of an ideal facial Cosmeceuticals Antioxidant vitamin, silica, glycosamine glycans, chondroitin sulphate and sea cucumber extract are special constituents for imparting everlasting youthful facial charm. Seacol TM is a highly purified collagen solution, which gives skin hydration, firmness, elasticity and smoothness. This maintains the 3D- structural integrity of the facial proteins with promising anti-wrinkle bioaction. The combination of rejuvenating minerals, aromatic oils and plant extracts provide facial tone up, charm and refreshing look.

3.3. *MABs*³⁰⁻³⁴

The marine organisms contribute to aphrodisiac activity through hormonal tropism. Oysters have rare amonioids minerals and vitamins which trigger the production of testosterone in males and progesterone in females. Their enhanced levels in blood circulation create sexual activism. The Oxylepins of Irish moss have structural resemblance with prostaglandins, therefore useful in erectile dysfunction . Surprisingly bioactive marine organisms have remarkable hormonal activity. They have androgenic activities of testosterone and progesterone. Testosterone is sex drive stimulator in both men and women and play role in maintaining muscle mass, strength and bone density. Progesterone regulates bone density, strength, sexual and mental function and counters the effects of menopause in women.

4. Conclusion

Marine biomolecules emerged as novel lifestyle drugs. Their potential gives incentive to drug discovery and development with an enormous increase in marketing them as vulnerable commercial entities. Antidepressive, cosmeceutical and aphrodisiacal marine biomolecules are innovative products, having not only a therapeutical impact but also at psychosocial level. The marine organisms have remarkable potential for research and development of Cosmeceuticals. The nano-particles of marine compounds, bioactive seaweeds and algae hold a great promise for the future cosmetic technology. Recently an amazing marine formulation called “Forever young” is one of the best beauty products. Marine cosmetology gifted beauty and skin care products of great promise. The natural advantage of the marine cosmetics has a potentiated market of the lifestyle drugs.

Antidepressive marine biomolecules have special benefits. They complement the concept of “energy medicine” (acugenics) and act as biochemical replenishers for maintaining healthy bioenergetic profile and physiological balancer of neurotransmitters “Frequen Sea” is an exceptional marine product of this category. Aphrodisiacal marine biomolecules are excellent hormonal activities. They contribute to pleasurable emotions. Bioactive marine organisms exhibited , the biological synergism of aphrodisiac, antioxidant and anti-ageing action therefore have therapeutic worth for designing of polypharmacophoric structures of lifestyle drugs.

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