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AYURVEDIC CONCEPT OF DRUG INTERACTIONS AND SYNERGISTIC EFFECTS

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ABSTRACT

Ayurveda is science of health restoration which presented different approaches for managing health ailments. Utilization of drugs for this purpose is prime focus approach of Ayurveda. These natural drugs act by various mechanisms and some them offers therapeutic response either individually or in combinations. Here concept of synergy and drugs interaction play important role. The Ayurvedic formulations possessing synergistic effect sometimes to enhance therapeutic responses of each other or some of them give undesirable biological responses due to the drug interaction. The synergistic effect increases therapeutic response of each other while drug interaction may reduces effect of each other. Hence, proper consideration is required for correct combinations of natural medicines to minimize risk of adverse events and to optimize therapeutic efficacy. This article summarizes Ayurvedic concept of drug interactions and synergistic effects of natural drugs.

KEYWORD:- *Ayurveda, Drug, Synergistic, Interaction, Adverse Effect.*

INTRODUCTION

The theories of ancient Ayurveda deeply rooted information on various foods, herbs, nutrition and plants. Ayurveda mainly addresses health issues using different therapies, these therapeutic approaches utilizes herbal medicines and classical Ayurvedic formulations in various health issues. These drugs when used in combinations may exhibits synergistic effects or adverse effects due to the unwanted drug interactions. Inappropriate combinations and self-medication may induce drug interactions related adverse effects. Beneficial drug interaction in combination therapy provides positive response which works synergistically to potentiate effects.[1-3]

Adverse drug interaction arises when drugs of opposing activities blocks effects of each other and creates undesirable effect. Ayurveda mainly described concept of drug or food interactions in terms of *Viruddha Ahara/Aushadha*, where incompatibility of medicinal substances causes adverse drug reactions. Therefore Ayurveda presented concept of *Samyoga* which referred synergy of ingredients.[3,4]

Drug-Drug interactions

Ayurveda *Acharya* discussed concept of *Viruddha Aushadha* which referred as combining of drug substances with certain incompatibility that may cause noxious effects. Practically incompatibility related drug interactions are different types as mentioned in **Figure 1**. *Manavirodha*, *Gunavirodha* and *Karma Virodha* are different types of incompatibilities related drug interactions. *Manavirodha* resembles quantitative incompatibility (honey and ghee in equal quantities). *Gunavirodha* referred to chemical incompatibility (milk and salt) and *Karma Virodha* represents pharmacological incompatibility (*Dhataki* and *Danti*). These antagonistic types of interactions can lead to toxic events and disease manifestation.[2-4]

Figure 1: Incompatibility related drug interactions.

Some examples of different types of interactions which exert positive responses is depicted in **Table 1.**[2-6]

Table 1: Example of drug interactions showing positive responses.

Condition	Drugs	Interaction Mechanism
Mercury poisoning	*Shuddha Gandhaka* with *ghee* and milk	Acts as an antidote due to its laxative and property, interfering with mercury absorption (Pharmacokinetic interaction).
Dehydration from *Kampillaka*	Decoction of *Babbula Mulatwak* and *Jeera*	Opposing actions of *Stambhana* and *Grahi* correct dehydration.
Shilajatu toxicity	*Maricha* with *ghee*	Neutralizes toxicity.
Mutrashmari	*Kadalikanda Swarasa* added to *Shwetaparpati* and *Badarshmapisti*	Facilitates management of urinary calculi.
Shushkakasa	*Pravalabhasma* with *Sharkara*	Effective in productive cough.
Mutrakrichra	*Pravalabhasma* with *Tandulodaka*	Relieves urinary discomfort.
Pradara	*Pravalabhasma* with milk	Controls excessive menstrual.

Concept of synergistic effects

The combination of drugs is employed to elicit more potent biological response as compared to individual drug alone. Ayurvedic formulations in combination are considered essential for managing chronic and severe diseases. Primary drug exert its effect while supporting herbs enhances action of primary drug. Assimilation drugs improve pharmacokinetics of main drug by increasing their absorption and bioavailability. When used appropriately, the combinations of drugs normally provide benefits in terms of enhanced efficacy and faster action, etc. Synergism in herbal combinations operates through various mechanisms as mentioned below.[6-10]

- ✓ *Arjuna*, contains saponin glycosides which improve cardiac function, while flavonoids provide antioxidant effect, here glycoside and flavonoid synergies each other.
- ✓ Chemical constituents of many herbs like neral and geranial exhibit antibacterial property; their activity is amplified when combined with myrcene.
- ✓ Ginger, black pepper and long pepper also demonstrate synergistic effects and enhances therapeutic outcome when used in combination as Ayurvedic formulation.
- ✓ In *Triphala*, there drugs are used namely; *Amla*, *Haritaki* and *Bahera*. These drugs together might have amplified effects of each other; therefore *Triphala* exerts enormous pharmacological activities with high potency.
- ✓ The anti-asthmatic property of *Vasaka* leaves enhanced when combined with *Piper longum*.
- ✓ In Ayurveda, the *Yogvahi* compounds improve bioavailability of drugs, by virtue of their ability to modify pharmacokinetic of main drug.
- ✓ Similarly *Anupana* refers to carriers which used along with drugs like; milk, honey and water. The *Anupana* used as vehicle to deliver drug, but *Anupana* not only acts as drug carriers but it also enhance potency and efficacy of herbal drug being co-administered.
- ✓ *Sahapana* denotes vehicle which used during the preparation of Ayurvedic formulations. *Sahapana* also increases therapeutic effect of drug; formulation like *Brahmi Ghrita* utilizes *Ghrita* as a *Sahapana* which also enhances therapeutic action of *Brahmi.*
- ✓ *Trikatu*, *Til Taila* and *Swarna Bhasma* serve as effective drug transporters and improve efficacy of Ayurvedic medicines being co-administered with them.

Advantages of synergism

- Synergism offers effective approach of drug combination
- It ensures targeted drug action
- This concept enhances efficacy of drugs being combined
- Improves dose regimen thus minimizes adverse effects
- Improves pharmacokinetic of drugs to achieve higher bioavailability
- Improves range of therapeutic applicability of drugs used in combination.
- Synergistic drug combination may provide rapid therapeutic responses.

CONCLUSION

According to Ayurveda the *Prakriti*, *Vikruti*, *Satmya*, *Vaya*, *Saara*, *Bala* and *Samhanana* should be analyzed carefully while performing clinical practices for disease diagnosis and management. The consideration of interaction between drug and *Anupana* can also modify the medicine's response; thus selection of appropriate vehicle is very critical to avoid adverse drug-vehicle interactions. When drugs are used in combination then they enhances potency and effectiveness of each other due to synergistic effects. Sometimes improper combinations can lead adverse interactions which may result toxic effects. The medical practitioner must remain aware about the possible drug interactions or synergism when combining herbal medicines together. Drugs in combination must be used correctly to ensure safety and efficacy of Ayurvedic medicines.

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