The Pharma Innovation Journal 2018; 7(9): 362-365

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2018; 7(9): 362-365

www.thepharmajournal.com
Received: 29-07-2018
Accepted: 30-08-2018

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Ethnoveterinary practice: An alternative treatment approach in contemporary India

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Abstract
The origin and evolution of ethnoveterinary practice in India has been reported since time immemorial. Since then, the knowledge, belief, skills and practices pertaining to diagnosis, treatment and management of animal and human diseases are imprinted and carried to future generations. In the light of evolution, the practice has come to limelight as an alternative low cost solution to conventional western medicine and readily practiced by ordinary farmers. Furthermore, it can be a major alternative to antibiotics use for the purpose of promoting growth and production performance of animals as well as for prophylaxis and treatment of common animal ailments. Therefore, it could be of great help in reduction of emergence of multidrug-resistant superbugs. This review was purposed to discuss the effectiveness of ethnoveterinary practice as an alternative treatment to western medicine and contemporary relevance of these practices in present arena.

Keywords: Ethnoveterinary practice, antibiotic alternative, superbug, rural area, ethnomedicine

Introduction
Ethno veterinary practices concern to animal healthcare is a century old practice stated back to domestication of various livestock species. It involves use of domestic knowledge, belief, practices and skills pertaining to healthcare and management of human, animals and birds (Mc Corkle, 1986) [15]. This branch of science, known as ethnoveterinary practices or EVPs is becoming a growing concern in the field of ethnobotany in the West (Lans *et al*., 2006) [13]. India being a developing country with rich ethnoveterinary knowledge, is sought to be a 'EVP hub' owing to practice with decades of experiences. Since time immemorial, the practice is mainly based on the use of plant formulations and other locally available cheap ingredients. Livestock raisers and local people with a strong knowledge of veterinary medicine usually follow traditional ways of classifying, diagnosing, preventing and treating common animal ailments. The traditional medicines that are commonly used for animal healthcare can cut down costs considerably. Moreover, they are readily available to the ordinary farmer.

Current status and future perspectives of ethno veterinary practice in India
In India, ethnoveterinary practices are common since time immemorial. The knowledge are imprinted and carried to future generations in the form of text manuscripts, by word of mouth and most of the folk health practices largely remain undocumented. A few oldest existing book of ancient era form the asset or repository of livestock health care practices in India. It includes Asvayurvedasiddhanta (Ayurvedic practices for horses), Asvacikitsita (therapeutics of horses), Asvavaidyaka (medicines of horses), Hastyayurveda (Ayurveda of elephants) (Tiwari and Pande, 2010) [10].

The contemporary India classifies ethnoveterinary systems on the basis of caste, religion and ecosystem. Therefore, sophistication, characteristics and intensities of these systems differ greatly among individuals, societies and regions. Also knowledge of ethnoveterinary medicine reported in different regions of modern India were documented and published. These include regions of Uttarakhand and Himalaya (Tiwari and Pande, 2010) [10], Rajsamand district, Rajasthan (Katewa and Chaudhary, 2000) [11], district Kachchh, Gujarat (Mistry *et al*., 2003) [18], southern Rajasthan (Takhar and Chaudhary, 2004) [32], Gujjar community, Uttarakhand (Gaur *et al*., 2010) [8], at Puskar animal fair, Rajasthan (Galav *et al*., 2010) [7], Alaknanda catchment of Uttarakhand (Phondani *et al*., 2010) [24], Jalna district, Maharashtra (Deshmukh *et al*., 2011) [4, 5], Shimoga district, Karnataka (Harsa *et al*., 2005 and Rajakumar *et al*., 2012) [10, 25], Kathua, Jammu and Kashmir (Sharma *et al*., 2012) [30], Bihar district, West Bengal (Bandyopadhyay and Mukherjee *et al*., 2005) [1], Purulia district, West Bengal

(Dey and De, 2010) [6], Uttar and Dakshin Dinajpur Districts of West Bengal (Mitra and Mukherjee, 2007) [19], Bankura District, West Bengal (Mukherjee and Namhata, 1988 and Ghosh, 1999) [20, 9], rural Sunderbans, West Bengal (Das and Tripathi, 2009) [3], Tharu tribal community of Uttar Pradesh (Kumar *et al*., 2012) [12], Visakhapatnam and Vizianagarm Districts, Andhra Pradesh (Narayana and Narasimharao, 2015) [21], Orissa (Sadangi and Sahu, 2004; Satapathy, 2010; Mishra *et al*., 2010; Mishra, 2014; Malik *et al*., 2012; Panda *et al*., 2016 and Panda *et al*., 2017) [27, 29, 16, 17, 14, 23, 22].

Documentation and validation of ethnoveterinary practices arouse a widespread interest in the early 1980s. All the above mentioned reports constitute only < 1 % of all the existing traditional knowledge. Some level of EVP knowledge resides in each and every corner of all the communities, which forms a repository. So each has to be identified, validated, documented, annotated, time tested, applied in the field and compared with western medicine in terms of effect and efficacy.

Ethno veterinary practice: An alternative treatment approach

India being a developing country, where nearly 80% of the population is below poverty line, mainly adopts agrarian economy. Animal agriculture is now a growing concern as it can satisfy unmet needs of the poor and can provide some income to the family. Being poor and weak, they can hardly afford for their own living, while to think for better animal living is still a long way to go. The practice is a cost effective and dynamic solution to the poor farmers for whom, fulfilling the basic amenities are always priority. Also it can be a major alternative to antibiotics use for the purpose of promoting growth and production performance or for prophylaxis and treatment of various pathogenic organisms. This way it could be of great help to reduce the emergence of multidrug-resistant pathogens or superbugs and to avoid antibiotic residues in food of animal origin, like meat, milk and egg. The constitutional ingredients of ethnoveterinary medicine are easily and locally available, easy to prepare and administer. Furthermore it has covered ever areas of veterinary specialization and all livestock species.

Ethnoveterinary practice: Elements

Added advantage to combat drug resistance and have fewer damaging side effects on health and environment than western medicine has a positive effect on the growth of this traditional wisdom. Traditional healing practices include three most important elements. These are application of natural products, appeal to natural forces and the last one is manipulation and surgery (Balaji and Chakravarthi, 2010) [31]. Natural products used are medicinal plants and by-products, edible earth and minerals, parts and products of animals and other ingredients (Balaji and Chakravarthi, 2010) [31]. There are various review reports stating various aspects of indigenous medicinal practices followed in different regions of the country for treatment and control of various diseases affecting both human and animals.

a. Medicinal plants and byproducts

Plants constitute most common and most easily available source of ingredients in the preparation of ethnomedicine. Almost all parts of plants, including leaves, bark, roots, fruits, flowers and seeds are used in medicinal preparations. The plants belonging to different families have property of healing and preventing various disorders. Some plant families have wide range of usage by ethno practitioners such as Acanthaceae, Amaranthaceae, Apiaceae, Apocynaceae, Asclepideaceae, Caesalpinaceae, Cucurbitaceae, Euphorbiaceae, Fabaceae, Liliaceae, Mimosaceae, Moraceae, Poaceae, Rutaceae, Rubiaceae, Solanaceae and Zingiberaceae.

The primary and secondary metabolites synthesized and accumulated by these plant such as terpenoids (monoterpenes, lactones, diterpenes, saponins and others), phenolics (phenols, flavonoids, quinones, tannins and lignins), sulphur compounds (glucosilates, disulphides and acetylenic thiophenes) and nitrogen compounds (alkaloids, amines, non-protein aminoacids and cyanogenetic glycosides), certain organic acids and polyacetylenes (Cotton, 1996) [2] constitute main principles of treatment. For example, root decoction or extract of *Triumfetta pentandra* is given to cattle after delivery to cure problems like poor lactation, expulsion of placenta (Deshmukh *et al*., 2011) [4, 5].

It has been reported that 70 phytotherapeutic practices involving 60 plants were used to treat 34 types of disease and disorders of livestock by tribal community of Malda district of West Bengal (Saha *et al*., 2014) [28]. Mostly treated ailment was agalactia with 7 different therapeutic uses and also five new ethnoveterinary formulations were documented during this survey for the first time (Saha *et al*., 2014) [28]. A number of plants, plant extracts and constituents have been identified as having anti-microbial, antiticks, insecticidal, pesticidal, antiviral or antifungal activities and are often considered as immune enhancing (Rios *et al*., 2005) [26].

b. Edible earth and minerals

Termite and ant hills serve as common source of edible earth used in ethnoveterinary preparations. Edible earth like limestone used commonly for decoctions.

c. Animal parts and products

Animal products such as milk, butter; animal byproducts such as skin, hide, bone and animal excreta such as dung and urine serve as common ingredients of ethnomedicine next to plants. Honey, vegetable oils and butter and salts are used for their healing and preservative properties.

Challenges faced by ethno veterinary practice in present arena

In current scenario, with increasing population the forest area is decreasing. The era is shifting towards western ends discouraging the aforestation and prefers more to readily available drugs. Also youths of India showing little interest towards this practice owing to disbelief and large communication gap with previous generation. Day by day, India is losing experienced persons as they are growing old and poor and there is no encouragement to pass this rural wisdom to next generations. Also, not a single Indian policy or regulation is framed till now to protect this traditional, indigenous rural wisdom. No one is aware of protecting this practice. So it is fading away in the mask of western medicine. The introduction of modern practices also made it difficult for the younger generations to appreciate and use the beliefs and practices of their forefathers. Despite recent efforts to promote the use of ethno veterinary knowledge worldwide, much information is only documented in field reports and scientific publications.

Ethnoveterinary practice: Limitations

Even though time tested, it cannot be followed in emergent situation as collection of ingredients sometimes become a major hurdle. Some remedies are inconvenient to prepare and use. Always experience matters in this practice with respect to amount of different ingredients to be used to prepare the final one. Also doses are uncertain and remedies are not standard. The diagnosis is mainly based on symptoms rather than underlying cause of the disease. Furthermore, ethnomedicines are not fast acting and potent and less suitable to treat epidemic and endemic infectious diseases. Sometimes, there is a chance of animals getting poisoned by use of high amount of poisonous plants like *Atropa Belladona*. Knowledge of subsequent antidote and correct diagnosis of poisoning case could of great help in the case.

Conclusion

Inaccessibility, cost and emergence of superbugs associated with use of conventional western animal health care system have encouraged constant use of cheap, safe, time tested and local resources based traditional rural wisdom. Furthermore it has raised immense contemporary relevance for treatment of both human and animal diseases. Though not as potent as modern allopathic medicine, it can be used to treat common and chronic diseases as well as initial stage of critical diseases, as an antibiotic alternative. Thereby, reduce the cost of treatment and avoid emergence of superbugs. Therefore, it is important to focus on the conservation of this rich ethnoveterinary wisdom which could serve as a source of future treatment remedies. Documentation of these practices and ethnomedicine used by tribal and rural people could be of great help to avoid fading memory.

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