Emergence of Drug Resistant Microbes

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Antibodies, once known as wonder drugs, (may be they still are), comprise of chemical, biochemical or biological derivatives that exert direct bactericidal effects and destroy the disease causing microorganisms, bacteria in particular. Unless however, used judiciously, and as presented on the basis of their pharmacokinetic, pharmacodynamics and genomic peculiarities these highly potent products also have the faculty to induce harmful after-effects and leave long-term sequelae which may be inimical to health. Self-medication is suicidal while indiscriminate use of any drug, for that matter, is loaded with occult hazards, like fostering resistance in the invaders microbe against the drug and initiation of hypersensitivity, toxicity, allergy, etc. in the recipient. A bactericidal or bacteriostatic antibiotic besides seriously affecting the normal micro-flora of body, otherwise considered beneficial for life, may also lead to emergence of microbial population that might learn to tolerate the deleterious properties of the medicines used.

As a result of empirical usage, mostly in improper doses and for wrong stretch of duration, resistant to almost all known antibiotics had widely emerged. Particularly in areas where such drugs are intensively & extensively used, the recalcitrant genes gradually take over the genesis of bacterial flora in animals as well as in human beings. With the passage of time, the quantum of drug-resistance in micro-organisms also tends to progressively aggravate. Population build up of such drug-resistant microbes gets logarithmically multiplied that may contain organism capable to jump the species-barrier and establish an endless cyclic spread of infection, from man-to-animal-to-man-to-animal, and so on. Such zoonotic dissemination may acquire global proportions and a disease, otherwise curable through usual antibiotic therapy, may defy international strategy to control it.

A population of bacteria resistant to antibiotics may crop-up due to:-

i) endogenous mutation or genetic re- assortment of a bacterium,

ii) exogenous infection of the body with a drug resistant strain,

iii) unnecessary and repeated exposure of the body to antibiotics,

iv) selection of survivors, (antibiotic kills susceptible bacteria, while the resistant ones keep multiplying).

v) Use of drug against which microbes have acquired resistance.

Resistance to antibiotics can also be transferred to other species of pathogenic or non-pathogenic microorganism, particularly those that happen to be in the body or are otherwise commonly present. Survival of resistant variants actuates unchecked procreation of the “selected” ones that can contribute to uncontrolled multiplication of pathogens hard to eliminate. Such an incessant phenomenon of drug resistance can become unnerving since the range and variety of therapeutic agents freely being used is quite wide and newer generations of “higher-potency varieties” are regularly being added to the already existing list.

In order to inculcate some sanity aimed at judicious application of bio-prophylactic and chemo-therapeutic measures to control or eradicate diseases in animal & birds, a mandatory code of procedures is therefore urgently needed to provide guidelines that may discourage gross abuse of drugs. All the stakeholders in Livestock & Poultry sectors need to take cognisance of this serious issue and ensure implementation of following measures:-

i) Quackery must be eliminated and the prescribing physicians, must be registered with the Pakistan Veterinary Medical Council,

ii) Farmers who rear the stock/flock and produce food for human beings must not use drugs on their own, instead seek and stick to professional advise. They must remember that self-medication can result in production losses, serious enough to throttle the venture,

iii) Instead of guesswork, Drug Sensitivity, where necessary, must be got ascertained at a Laboratory competent to do so,

iv) Impotors & Manufacturers of pharmaceuticals must monitor the results of therapy with their products. They would never like their reputed products getting discredited through misuse.

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v) Whole-sellers, Retailers, petty shop-keepers of such drugs, must exercise discretion and refuse sales of potent drugs without prescription from a Registered veterinary Medical Practitioner.

vi) Veterinarians must find out mode of action & incompatibilities of the drug and observe instructions given by the manufacturer pertinent to indication, counter-indications, pharmacokinetics, Pharmacodynamics, idiosy crasys, after-effects, posology, duration of treatment and withdrawal mandatory to contain the transfer of residue if any, to the consumer of Food from animal origin.

Main ones lies with organisation like Pakistan Poultry, Association, Pakistan Dairy Association, etc, who regulate affairs in the Livestock & Poultry sectors. Injudicious and uncalled for medication of animals & birds can to a great extent be controlled through education of the Farmer on the effective strategies that are indispensable to maintain proper health of their productive Stocks, and control or cure a disease after confirmative diagnosis. Unless some concerted move is launched by such bodies and all stake holders, the prevalent abuse of drugs shall continue unabated, and result in uncontrollable apperance of more & more such disease-causing agents that being more & more resistant to usual line of treatment may produce atypical syndromes, that may become difficult to diagnose and treat. Productivity will also go down, besides depletion of stock/flock due to ill-heath. The end result will be “increased cost of decreased production”. Both the Producer as well as the Consumer of Milk, Meat & Eggs, etc, will suffer, as is happening to-day.

We must remember, there is NO MEDICINE & NO VACCINE that may replace MANAGEMENT, which is a multidimensional pre-entive strategy to raise healthy animals and obtain best performance from them. Prophylactic and Curative measures, when applied correctly, do support Managemental protocols, but cannot be their substitute.