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Effect of Pesticide on Human Health

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ABSTRACT:
Most pesticides have the potential to be hazardous to people, with serious health repercussions. There is proof that parental exposure as well as exposure during childhood or adolescence may raise the hazards over the long run. Diabetes, Alzheimer's, Parkinson's, asthma, and other human diseases have all been related to pesticide exposure. Individuals exposed to pesticides have a higher chance of developing different types of cancer, including childhood cancer,,thyroidcancer,brain tumour .Because of the need for food security and vector control, pesticides are used to manage pests and will likely continue to be utilised in the future.

KEYWORDS:classification, microbial pesticides, biochemical pesticides, effect, potential impact on human health.

I. INTRODUCTION:

Impacts of pesticides are more likely to affect some people than others. For instance, it is well known that newborns and young children are more vulnerable than adults to the hazardous effects of pesticides. Due to their increased exposure, pesticide applicators and farm labourers are also more susceptible. See the Pesticide Database of the Pesticide Action Network for further details regarding the impacts of particular chemicals or pesticide compounds. See Beyond Pesticides' Pesticide-induced diseases database for a summary of research tying certain diseases to pesticide use. Acute Health Consequences Pesticide exposure can have immediate negative health effects, such as irritation of the nose, throat, and skin, which can result in rashes and blisters as well as burning, stinging, and itching. Diarrhea, vertigo, and nausea are also frequent. Certain pesticides, particularly pyrethrin/pyrethroid, organophosphate, and carbamate insecticides, can cause extremely severe reactions in people with asthma.

One of the few harmful compounds intentionally introduced into the environment to kill living things is pesticides. Rodents, fungi, and insects Although herbicides, fungicides, and several other compounds used to control pests are also classified as pesticides, the term pesticide is frequently misconstrued to mean just insecticides.

Pesticides are mostly used in agriculture to chemically control certain pests. Moreover, pesticides are employed in public health initiatives to manage invasive plants in ornamental landscaping, parks, and gardens, as well as vector-borne diseases. They are also helpful in preventing or reducing the growth of bacteria, fungi, and algae in appliances like refrigerators and electrical equipment. Materials for food packaging, paper, cardboard, paint, carpets, and more Early development may be negatively impacted by exposure at even extremely low levels. The science Children are more vulnerable to pesticides than adults because of their makeup, behaviour, and physiology.

Many pesticides have been linked to environmental and health problems, and some have even been banned from use in agriculture. Pesticides can be ingested, inhaled, or applied directly to the skin. The type of pesticide used, the length and method of exposure, as well as the individual's health status, all affect the potential health result. Pesticides may be digested, expelled, stored, or bio-accumulated in body fat within an animal or human body. Chemical pesticides have been linked to a variety of detrimental health consequences, including impacts on the skin, gastrointestinal tract, nervous system, respiratory system, reproductive system, and endocrine system. Moreover, high levels of occupational, unintentional, or deliberate pesticide exposure can lead to hospitalisation and even death. Pesticide residues may be observed in a crop.

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Health Effects of Certain Classes of Pesticides
Organophosphates & Carbamates:

These pesticides affect the brain and neurological system and interfere with nerve signal transmission, similar to nerve gas. Headaches, nausea, lightheadedness, vomiting, cramping in the muscles, diarrhoea, and chest pain are some of the symptoms. Convulsions, respiratory problems, involuntary urination, unconsciousness, and death are all possible symptoms of severe poisoning. Each year, toxic pesticides harm the neurological system in hundreds of thousands of people all over the world.

Soil Fumigants:

These pesticides are sprayed on the soil, where they turn into a gas that is poisonous to nematodes, fungi, bacteria, insects, and plants. Since they are gases, they escape from the earth and expose adjacent residents and workers to them. In California, substances including 1,3-dichloropropene, chlorpicrin, metal sodium, and metal potassium are frequently employed as soil fumigants. Skin, eye, and lung irritation as well as severe eye and lung irritation are signs of fumigant exposure. Metal sodium harms reproduction, and dichloropropene, metal potassium, and metal sodium are all carcinogens. Premature birth is more prevalent in areas with high fumigant use than it is in counties with low fumigant use.

Pyrethroids:

These insecticides are synthetic chemicals that resemble botanical molecules physically but were developed to be more enduring. They are poisonous to the neurological system, and it is feared that a foetus cannot effectively break down these toxins while pregnant. Tremors, excessive salivation, headaches, exhaustion, vomiting, itchy, stinging skin, and uncontrollable twitching are all signs of pyrethroid toxicity. Several pyrethroids also have long-term negative effects on health. For instance, resmethrin harms reproduction and promotes cancer. Statistics from the Centers for Disease Control and Prevention's nationwide bio monitoring programme link pyrethroid exposure to heart disease. Cypermethrin, fenvalerate, and deltamethrin are all carcinogens that harm genetic material and impair reproduction.

Classification of pesticide

1. Toxicological Classification of Pesticide

Many types of insecticides, herbicides, fungicides, rodenticides, wood preservatives, garden chemicals, and household disinfectants that are used to either kill or protect against pests are together referred to as pesticides [1]. from one lesson to the next. As a result, it is important to group individuals according to their characteristics and research within each group. Chemicals created by humans; synthetic pesticides are not found in nature. They are divided into different classes according to the requirements. Currently, Drum suggests three different classification systems for pesticides. These three widely used techniques of classifying pesticides include classifying them according to their mechanism of entry, classifying them according to their function in killing pest organisms, and classifying them according to their chemical make-up.

1.1. Classification Based on Mode of Entry

Modes of entry refer to the methods by which pesticides enter or come into contact with the target. Systemic, contact, gastrointestinal toxins, fumigants, and repellents are some of them. systemic insecticides Pesticides that are absorbed by plants or animals and spread to untreated tissues are known as systemic pesticides. An herbicide that is absorbed into the plant can reach untreated portions of the leaves, stems, or roots. They have the ability to eliminate weeds with only a partial spray coverage. To successfully destroy particular pests, they can migrate via the plant vascular system and infiltrate plant tissues. For the management of pests like fleas, lice, and warble grubs, several systemic insecticides are also applied and spread via animals.

1.2 Non-systematic contact

Because they act on target pests when they come into contact, non-systemic pesticides are sometimes known as contact pesticides. To be effective, pesticides must come into direct contact with the pest. Upon contact, the pesticide enters the bugs' bodies through their epidermis and poisons them to death. Certain pesticides may not penetrate plant tissues, and as a result, may not be carried through the vascular system of the plant. Parquet and diquat dibromide are two examples of contact insecticides.

1.3. Stomach poisoning and stomach

Pesticide that poisons cause death by ingestion enters the body of the pest through its mouth and digestive system. Stomach poisons are acquired by pests while they are feeding when they consume the insecticide that has been sprayed to

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the plant's leaves and other components. Insects' mouths and digestive tracts can also allow stomach toxicants to enter their bodies, where they are absorbed into the organism. This is more appropriate, especially when controlling mosquito or black fly populations by adding bacteria or their poisons to the water, where filter-feeding larvae will ingest the poison. By eliminating the midgets of the larval midges, such as Malathion, these insecticides kill the vector.

1.4Fumigants

Pesticides known as "fumigants" act or may kill the pests they are intended to control by vaporising them. When used, these herbicides produce toxic fumes. The vapour form poisons pests by entering their bodies through their spiracles and entering their trachea. While packaged under high pressure, some of their active constituents are liquids, but when they are released, they transform into gases. Some active components are not created under pressure and are volatile liquids when contained in a regular container. Fruits, vegetables, and grains are fumigated to get rid of pests that are present in stored products. They are also very helpful in reducing soil pests.

1.Classifications based on pesticide function and pest organism they kill

Using this approach, pesticides are categorised according to the organism of the target pest and are given unique names that represent their activity. The Latin term cide, which isused as a suffix to the corresponding name of the pests they kill, gave origin to the group names of these insecticides. No, all pesticides have the word "cide" at the end. Certain pesticides are also categorised based on how they work. Examples include growth regulators that either promote or inhibit pest growth, defoliants that cause plants to lose their leaves, desiccants that speed up plant drying for mechanical harvesting or kill insects,repellents that keep pests away, attractants that draw pests to traps, and more. chemosterilant Which sterilize pest number

Moreover, some pesticides may be included in more than one pesticide class since they have the ability to control many pest classes. Because it manages mites, insects, and nematodes, respectively, aldicarb, which is frequently employed in Florida citrus industry, may be regarded as an acaricide, insecticide, or nematicide. Another typical illustration is 2, 4-D, a broadleaf 144 herbicide. Environ. Sci. &Engg., Vol. 6: Toxicity weed control, but at low doses it acts as a regulator of plant development. Given that theyare used to control pests, attractants andrepellents are regarded as pesticides.

Table 1: Pesticide classification by target pests (modified after Fishel[5])

Type of pests	*Target pests/Function*	*Example*
Insecticides	Kill insects and other arthropods	Aldicarb
Fungicides	Kill fungi (including blights, mildews, molds, and rusts)	Azoxystrobin
Bactericides	Kill bacteria or acts against bacteria	Copper complexes
Herbicides	Kill weeds and other plants that grow where they are not wanted	Atrazine
Acaricides	Kill mites that feed on plants and animals	Bifenazate
Rodenticides	Control mice and other rodents	Warfarin
Algaecides	Control or kill growth of algae	Copper sulfate
Larvicides	Inhibits growth of larvae	Methoprene
Repellents	Repel pests by its taste or smell	Methiocarb
Desiccants	Act on plants by drying their tissues	Boric acid
Ovicides	Inhibits the growth of eggs of insects and mites	Benzoxazin
Virucides	Acts against viruses	Scytovirin
Molluscicides	Inhibit or kill mollusc's *i.e.* snail's usually disturbing growth of plants or crops	Metaldehyde
Nematicides	Kill nematodes that act as parasites of plants	Aldicarb
Avicides	Kill birds	Avitrol
Moth balls	Stop any damage to cloths by moth larvae or molds	Dichlorobenzene
Lampricides	Target larvae of lampreys which are jawless fish like vertebrates in the river	Trifluromethyl nitrophenol
Piscicides	Act against fishes	Rotenone
Silvicides	Acts against woody vegetation	Tebuthiuron
Termiticides	Kills termites	Fipronil

Classification based on Chemical composition of pesticides: The most prevalent and practical technique of categorising pesticides is based on the chemical makeup and makeup of the active components. Such a classification provides information about the effectiveness, physical

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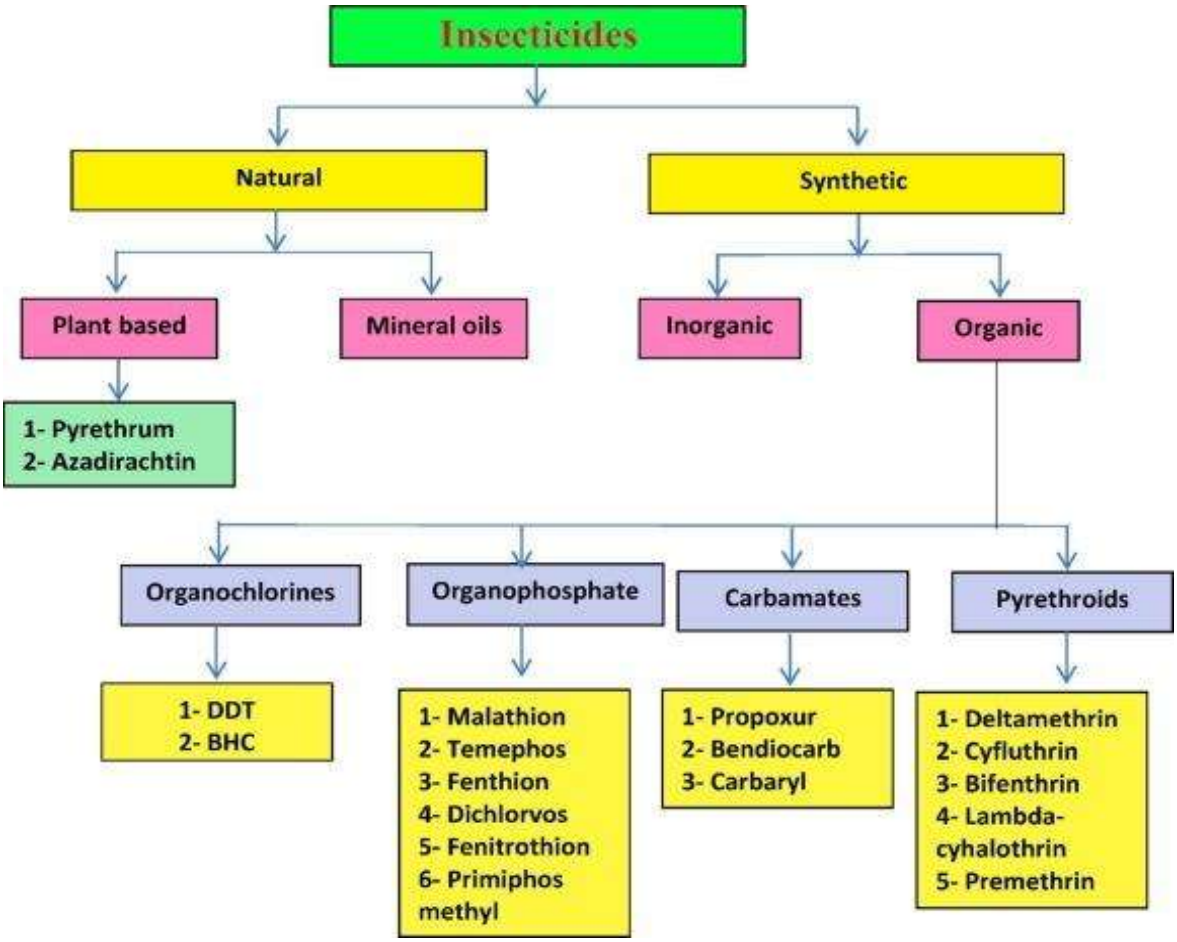
characteristics, and chemical composition of the various pesticides. When deciding on the manner of application, the precautions to be taken during application, and the application rates, knowledge of the chemical and physical properties of pesticides is highly helpful. Pesticides are divided into four main classes according to their chemical makeup: organochlorides, organophosphorus, carbamates,pyrethrin, and Pyrethroids. Pesticides are categorised chemically and in a pretty complicated way. Modern pesticides are typically organic compounds.They comprise both synthetic and natural insecticides. However certain inorganic substances are also employed as insecticides. Insecticides are significant insecticides that fall under a number of sub-categories. Insecticide subclassification is shown in fig.

Organochlorine

Organochlorine Pesticides having five or more chlorine atoms bonded to an organic component are called organochlorines. These were among the first classes of pesticides to be produced and employed for both public health and agricultural purposes. The majority of them have a long-lasting residual effect on the environment and were frequently employed as insecticides to control a variety of insects. These insecticides may interfere with the insects' neurological system, causing convulsions and paralysis before their eventual demise. Examples of these pesticides that are used most frequently include DDT, lindane, endosulfan, aldrin, dieldrin, and chlordane. Although the production and usage of DDT were outlawed in the majority of industrialised nations, including the United States, many years ago, it is still employed for vector control in the majority of tropical developing nations.



Organophosphate

Due to their numerous uses, organophosphate pesticides are regarded as one of the broad spectrum pesticides that may effectively control a variety of pests. They can cause nerve poisons via causing stomach poison, contact

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poison, and fumigant poison. These insecticides are also biodegradable, don't pollute the environment excessively, and slow the development of pest resistance. As cholinesterase inhibitors, organophosphorus insecticides are more harmful to vertebrates and invertebrates than other insecticides and cause a synapse's persistent overlay of the neurotransmitter acetylcholine. Due to the inability of nerve impulses to pass the synapse, voluntary muscles twitch rapidly, which causes paralysis and eventually death. Parathion, malathion, diazenon, and glyphosates are a few of the commonly used organophosphorus pesticides.

Carbamates

Organophosphates and carbamates share a similar structural makeup, although their sources are different. Although carbamates are formed from carbamic acid, organophosphates are derived from phosphoric acid. Similar to organophosphate pesticides, carbamate insecticides function by interfering with nerve signal transmission, which causes the pest to become poisonous and die. They are occasionally used as fumigants, contact poisons, and poisons for the stomach. Under natural conditions, they are easily degraded with little environmental pollution. Insecticides in this class that are often used include carbaryl, carbofuran, propoxur, and aminocarb.

3. **Classification based on sources of Origin**

A pesticide is a chemical or biological product that works to eliminate the pest or stop the harm that pests do. Pesticides can be divided into chemical pesticides and bio-pesticides depending on their sources of origin. Host specificity is oneof the key advantages of employing biological insecticides. In contrast to chemical pesticides, which often have a wide range and affect a big group of non-target organisms, biological pesticides only affect the target pest and strongly related organisms. Since they require littleapplication and are less toxic and easily decomposable, bio-pesticides are typically environmentally beneficial. Chemical pesticides are extremely harmful and not usually biodegradable, which leads to significant environmental damage. The fact that bio-pesticides are less sensitive to genetic change in plant populations is another significant benefit of employing them. This demonstrates how unlikely it is for bugs to develop a resistance to chemical pesticides, which is rarely the case. Organochloride, organophosphate, carbamate, and pyrethroids are other subgroups of chemical pesticides that are addressed in the section above. Bio-insecticides are a class of pesticides made from natural resources like plants, animals, and microorganisms. They are divided into three categories.

Microbial Pesticides

Microorganisms like bacteria, fungi, or protozoa are the main component of microbial pesticides. These pesticides can cause microbial infections or the release of poisons that kill insects. This series of insecticides includes the live bacterium Bacillus sphaericus and the bacterial toxin generated by Bacillus thuringiensis. The typical route of action is the production of a protein that binds to the gut receptor of the larvae and starves the larvae. The larvae of black flies andmosquitoes are both susceptible to these two bacterial toxins. Compared to biochemical pesticides, most microbial pesticides are more selective.

Biochemical pesticides

Biochemical pesticides, which contain natural substances with harmless ways to control pests, make up the third class of pesticides. Many fragrant plant extracts and insect sex pheromones are examples of biochemical insecticides.

Effect of pesticide

Pesticides have positive benefits on agricultural and public health, but they can also have negative consequences on the environment and on people's health. Due to their high biological activity and toxicity, pesticides occupy a special place among environmental pollutants. Most insecticides do not differentiate between pests and other accidental lifeforms that are similar to pests. If used improperly, they could be detrimental to people, animals, other living things, and the environment. According to estimates, 500,000 to 1 million people are poisoned annually and between 5000 and 20,000 individuals die as a result of Agricultural workers make up at least 50% of the drunk and 75% of the pesticide-related fatalities. The remainder is getting sick from consuming tainted food.

Acute Health Effects

Pesticide exposure can have immediate negative health effects, such as irritation of the nose, throat, and skin, which can result in rashes and blisters as well as burning, stinging, and itching. Diarrhea, vertigo, and nausea are also

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frequent. Certain pesticides, particularly pyrethrin/pyrethroid, organophosphate, and carbamate insecticides, can cause extremely severe reactions in people with asthma.

Pesticide poisoning symptoms frequently resemble those of the cold or the flu. Pesticide poisonings are frequently misdiagnosed and underreported because they resemble or are the same as other illnesses. It's possible that an individual's immediate symptoms won't be severe enough to make them need medical attention, or that a doctor won't even bother to enquire about pesticide exposure. Nonetheless, if you believe you may have become poisoned by pesticides, you should seek medical assistance right once.

Chronic Health Effects

Cancer and other malignancies, damage to the brain and nerve system, birth defects, infertility and other reproductive issues, liver, kidney, lungs, and other body organ damage are only a few of the chronic health impacts. Chronic effects may take weeks, months, or even years to manifest after exposure, making it challenging to correlate pesticides' negative health effects.

Studies on leukaemia, lymphoma, and malignancies of the brain, breast, prostate, testes, and ovaries in humans have linked pesticides to these diseases. Pesticides can cause birth abnormalities, stillbirths, spontaneous abortions, sterility, and infertility, among other reproductive harms.

Potential Impact on Human Health

Pesticides can enter the body through a number of different routes, including oral exposure from consuming tainted food and water, cutaneous exposure from direct contact with pesticides, and inhalation of pesticide-contaminated dust, mist, or air. Pesticides are sprayed onto food, particularly fruits and vegetables. They also leak into soils and groundwater, which can contaminate drinking

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water. The degree to which chemicals have an impact on human health depends on their toxicity and the length and intensity of exposure. Chemical toxicity is influenced by the type of toxin, the exposure route, the dose, and the organism. Chronic or acute toxicity are also possible.A substance's capacity to produce adverse consequences that appear shortly after ingestion, such as within a day or a few hours, is known as acute toxicity. Chronic toxicity refers to a substance's capacity to harm human health when exposed to it over an extended period of time. Insecticide toxicity is frequently described as a 50% fatal dose or 50% deadly concentration. When a population is genetically homogeneous, the LD50 is the single exposure dose of the toxin per unit weight of the organism needed to eliminate 50% of the test population. The measurement is in milligrammes for every kilogramme of body weight. When a population is genetically homogenous, LC50 refers to the chemical concentration in the external medium water that results in 50% of the test population dying.

All pesticides are examined for their potential to cause cancer utilising in vitro and animal tests. All active

Pesticide Exposure in Children

1. Childhood Cancer

Chemicals in pesticides are listed by the EPA along with their potential carcinogenicity. The process for determining probable carcinogenicity has been modified. Prior to 1996, pesticides were given a letter classification; since categories and classifications are not interchangeable, both still exist today. The EPA provides a report via email listing the pesticides that are labelled as "possibly carcinogenic" or "likely to be carcinogenic to humans." This paper covers a number of well-known and often used operations, carbamates, pyrethroids, and fungicides.There are differences in carcinogenicity potential among pesticide classes. Be aware that a pesticide that has "replaced" the usage of cancer-causing Chemicals, like cypermethrin, has the potential to cause cancer.

A substantial amount of observational epidemiological data demonstrates a link between pesticide exposure and childhood cancers. However, the evidence base includes studies that found no association between childhood cancers and pesticides or few associations that cannot be ruled out as a chance finding. Overall, the most comprehensive reviews of the existing literature implicate an association of pesticides with leukemia and brain tumors.

2. Brain Tumors

16 case-control studies investigating links between brain tumours and pesticide exposure were included in Zahm and Ward's 1998 review. Seven of these findings attained statistical significance. Among these, 12 discovered an elevated risk estimate for brain cancers following pesticide exposure. Parental usage of pesticides in the home, garden, and on pets was the main cause of associated exposures. Given the incomplete exposure assessments, limited sample sizes resulting from a very uncommon juvenile outcome, and a variety of brain tumour forms among individuals, it is challenging to interpret these findings.

3. Exposure: Cancer

Many carefully planned epidemiological studies provided strong evidence linking pesticide exposures and cancer incidence. Leukemia, clone thyroid, brain, and other types of cancer are all greatly increased by the use of pesticides in homes and on a large scale. We can better understand the carcinogenicity of pesticides thanks to collaborative work in molecular biology, pesticide toxicology, and epidemiological investigations. Many pesticides, including sulfallate, organochlorines, and sulphates, are known to cause cancer according to epidemiological studies. Lindane and chlordane, on the other hand, are known to cause tumours.

4. Thyroid cancer

Dioxins, phthalates, polybrominated diphenyl ethers, and other halogenated organochlorines are some of the pesticides that have been linked to disruptions in normal thyroid function through effects on hormone production, transportation, and metabolism. Some substances that attach to the thyroid gland's receptor sites and share structural similarities with thyroid hormones. The Agricultural Health Study's investigation into the risk of cancer, particularly thyroid cancer, and exposure to the chemical atrazine. Atrazine is applied by 36,357 people overall, including 3,146 cancer patients and 29 thyroid cancer patients. Due to the tiny number of applicators who have developed cancer, this research only finds a few correlations between atrazine exposure and cancer.

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5. Alzheimer disease

Dementia is a decline in brain function, and it has become more prevalent recently. One theory suggests that the present rise in dementia cases is related to increased pesticide exposure, which may have affected dementia etiology. Yet, additional research explains that pesticides have an impact on neuron function at the molecular level by mistrusting microtubules and causing hyperphosphorylation, which causesAlzheimer's disease. Pesticides such as organophosphate and organochloride have been shown to affect the control of acetylcholinesterase at synaptic junctions in the nervous system and may cause Alzheimer's disease, especially in people who are exposed in their later years of life. Another study demonstrates that certain herbicides can impair mitochondrial bioenergetic functions, oxygen metabolism, and redox function, which can result in Alzheimer's disease.

Parkinson disease

Parkinson's disease develops when the brain's substantial nigra cell fails to release dopamine, which results in a loss of muscle control, tremor, and coordination. According to research, some pesticides like rotenone and paraquat damage dopaminergic neurons, reduce dopamine synthesis, and cause Parkinson's disease. It has been discovered that there is a connection between pesticide exposure and Parkinson disease. Pesticides and their metabolites affect mitochondria and alter xenobiotic metabolism, which causes Parkinson disease According to a different study, rats exposed to rotenone develop neurodegeneration in the peripheral nervous system over time and their motor nerve conduction velocity declines, especially in the sciatic nerves. It results from the peripheral nervous system's lack of dopamine and chemical synapses being disrupted.

6. Asthma

There is evidence from numerous clinical and epidemiological research linking pesticide exposure to asthma and bronchial hyperreactivity symptoms. Exposure to pesticides may aggravate asthma by inflaming the airways, suppressing the immune system, or upsetting one's hormones. In addition, 359 women and children in the USA were studied by Raanan et al. to determine the connection between early life exposure to Ops and respiratory outcomes. They came to the conclusion that such exposure might cause respiratory symptoms that are typical of childhood asthma. Visiting a pesticide-sprayed field was positively linked with the occurrence of ocular-nasal symptoms in a cross-sectional study of female farm labourers in Africa.926 pesticide applicators who had active asthma participated in another trial. Positive exacerbation-pesticide correlations were seen in the USA among participants in the Agricultural Health Study for the herbicide pendimethalin and the insecticide aldicarb. Only a few pesticides are strong enough to harm the bronchial mucosa, and the majority of pesticides have a limited ability to sensitise airways in people exposed to them. Any usage of pesticides on the farm was found to be related with atopic asthma in a research involving 25,814 farm women in the USA.

7.Diabetes

New scientific data suggests that exposure to environmental contaminants may have an impact on diabetes. Pesticide exposure, especially to organochlorines and their metabolites, may have adverse health effects. increased risk of type 2 diabetes and associated complications According to a thorough evaluation of the literature, there is a correlation between elevated levels of PCBs and other organochlorine pesticides in the serum and diabetes. While most research were cross-sectional, the actual datasets did, however, have significant limitations. Most estimates were based on extraordinarily large Confidence intervals, and only a small number of research addressed selection bias and the confounding effect.Exposure to organochlorine pollutants, such as polychlorinated biphenyls and p,p′-DDE, is linked to an elevated incidence risk of type 2 diabetes, according to a meta-analysis of 23 relevant papers. Positive relationships between T2DM risk and exposure to organochlorine pollutants have been reported in some epidemiological investigations with various populations. In Bolivia, a cross-sectional study involving 116 pesticide sprayers and 92 non-exposed controls found that 61.1% of the sprayers had aberrant glucose regulation compared to 7.9% of the non-exposed controls. A study was conducted in the USA on 13,637 farmers' spouses who were reported to have used pesticides at the time of enrollment. Five chemicals were thereby positively linked to diabetes incidence. 506 women out of 11,273 who used agricultural pesticides in total. More research is required to establish the validity of earlier findings based on self-reporting, to look into potential exposure-response

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correlations, and to investigate the toxicological impact of pesticides in more detail.

How to remove Pesticides on vegetables and Grains

1. Washing

Washing is the initial stage in the process of removing pesticide residues from food goods. Most of the contact pesticide residues that often occur on the surface of vegetables and fruits can be removed by washing with water that contains 2% salt.

By washing in cold water, you can get rid of 75–80% of pesticide residue. Fruits including grapes, apples, guavas, plums, mangoes, peaches, and pears, as well as fruity vegetables like tomatoes, brinjal, and okra, need two to three washings to remove the pesticide residues on their surfaces.

Vegetables with green leaves must be well cleaned. Normal processing methods including washing, blanching, and cooking effectively remove the pesticide residues from green leafy crops.

Blanching

Most veggies receive a brief treatment in hot water or steam. Blanching can efficiently get rid of some pesticide residues. However, it is crucial to thoroughly pre-wash the fruits and vegetables before blanching.

Peeling

Peeling can get rid of systemic and contact pesticides that show up on the outside of fruits and vegetables.

Pesticide residues in the finished product can be further decreased through processes like concentration, dehydration, and extraction from the raw product. With processed foods, processing generally has a small overall impact on residue levels.

Cooking

Animal Products

Since animals eat pesticide-sprayed fodder, animal products are a primary source of contamination for pesticide residues in human diets.

Pesticide residues from the animal fat tissues will be eliminated during pressure cooking, frying, and baking.

Dairy products

Boiling of milk at elevated temperatures will destroy the persistent pesticide residues.

Vegetable Oils

Refined oils will have fewer amounts of pesticide residues.

Household heating of oils up to a particular flash point will remove pesticide residues.

II. CONCLUSION

Although pesticides are developed to prevent, remove, or control Harmful pests, concerns of the hazards of pesticides towards the environment and human health have been raised by many studies. There Are indeed many inherent problems in conducting large-scale experiments to directly assess the causation of the human health problems associated with the use of pesticides. However, the statistical associations Between exposure to certain pesticides and the incidence of some diseases are compelling and cannot be ignored.Moreover, some members of the population are genetically predisposed to diseases linked to pesticides, making them more vulnerable than others. According to evidence, a large portion of this exposure takes the form of chemical mixtures, and the hazardous effects of such exposure.

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