Open Access

Journal of Respiratory Medicine and Clinical Pulmonology

Review Article

Pesticides and Respiratory Health: The Key of the Cation-Chloride Channel

Florent Pirot*

Independent Researcher, Valbonne, France

1. Abstract

Some pesticides are found to have a strong relationship with diseases such as asthma, lung cancer, chronic obstructive pulmonary disease (COPD) and chronic bronchitis. This is explained by the cation-chlorine channel in the lung and its role in bringing alpha emitters associated in synergy with the organochlorine pesticide into the structure of the lung and fixating it within. Alpha emitters such as radon or polonium from cigarettes (for instance) associated with the chlorine component of the pesticide molecule, or other atoms also able to penetrate the cation-chloride channel, and found in other pesticides, can become involved in a wide variety of respiratory diseases. A treatment proposal is elaborated in conclusive remarks.

2. Introduction

Chloride channels in lungs are involved in a wide variety of diseases, from viral infections including SARS-CoV2, pulmonary arterial hypertension, cystic fibrosis and asthma [1]. Cl- is the "most critical anion to regulate the balance of cations and anions to ensure electrical balance" [1]. A pattern with the cation-chloride channel in the brain and neurological diseases such as dementia was shown in [2]. It is clear that there is a similar mechanism in the lungs, that explains the findings of toxicity for several pesticides. The alpha emitters' decay can break the molecule and separate the anion from the cation. Polonium 210 is a well-known component of cigarettes that makes them particularly dangerous in this regard, because of its high alpha activity, as tar can trap the radioactive substances within the lungs [3] and cause cancer [3-5]. Radon as well has been largely associated with lung diseases [6], being the second leading cause of lung cancer [7]. There are several sources of exposure to alpha emitters in the environment, from radon and cigarette smoke to TENORMs in fuels, coal fly ashes, and phosphated fertilizers, as well as NORMs in draft water. All these can influence the background for pesticide use, phosphated fertilizers and alpha emitters in draft water in particular.

3. Asthma and Wheeze

In [8] is found that a series of pesticides involving chlorine or sulfur have the highest odds-ratios for allergic asthma : coumaphos, heptachlor, parathion, tetrachloride and carbon disulfide. Both sulfur [9] and bromide [10] can permeate the cation-chloride channel, and ethylene dibromide is also found to be associated with allergic asthma. The same applies to non-allergic asthma, with DDT, malathion and phorate as well as petroleum oil which can also include sulfur [11], found associated with it [8]. Nitrates can also permeate the cation-chloride channel [10] and pendimethalin is found associated with allergic asthma, and sulfur-containing aldicarb as well [8]. The same mechanism is involved in increased wheezing with atrazine (chlorine), chlorphyrifos and parathion, as well as (in another study) chlorimuron-ethyl, dichlorvos and phorate. Permethrin (chlorine) was also found to be associated with non-allergic asthma [8]. Metalaxyl was also found to be associated with allergic asthma – nitrates indeed can be assimilated through the cation-chloride channel, as stated above. Wheeze was also associated with paraquat (chlorine) and EPTC (sulfur), as well as with parathion, malathion (sulfur) and chlorpyrifos (sulfur and chlorine).

***Correspondence to**: Florent Pirot, Independent researcher, Valbonne, France

Received date: Aug 12, 2024; **Accepted date: Sep** 04, 2024; **Published date:** Sep 10, 2024

Citation: Pirot F (2024). Pesticides and Respiratory Health: The Key of the Cation-Chloride Channel. Jour of Respiratory Med and Clin Pulmonology 2024; v1(2): 1-3

Copyright: © 2024 Pirot F. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

4. Chronic Bronchitis

Heptachlor was found to present the strongest association with chronic bronchitis [8]. Dichlorvos, DDT, carbofuran (nitrogen), cyanazine (chlorine and nitrogen) and paraquat (chlorine) were also associated with chronic bronchitis [8]. Interestingly, farmer patients reporting chronic bronchitis were more likely than controls to have an history of other respiratory outcomes such as asthma, emphysema and wheeze [12]. Chlordane, lindane (chlorine) and toxaphene (chlorine) were also found to be associated with chronic bronchitis, and among organophosphates, coumaphos, diazinon (sulfur), dichlorvos, malathion, parathion, as well as carbamates (nitrogen). Chlorimuron-ethyl and petroleum oil were also associated with chronic bronchitis [12]. The same pathway is obviously associated with chronic bronchitis, involving the cation-chloride channel and alpha emitters bringing in the crucial pesticide atom such as chlorine, sulfur or nitrogen.

5. Showing the Role of Alpha Emitters

In summary, it is clear that alpha emitters associate with the pesticide molecule's active atom to permeate the organism, drifting into the cells through the cation-chloride channel, and affect the metabolism, causing potentially cell necrosis through direct alpha decay, or tumorogenic patterns through the bystander effect [13]. COPD and lung cancer have been associated, suggesting "shared pathological mechanisms such as chronic inflammation, epigenetic changes, and impaired DNA repair processes" [14]. These are obviously a consequence of exposure with alpha emitters. DNA damage is a well-known effect of exposure to alpha emitters [15] (with a dose-dependence repair rate identificated) [16]. It was suggested in [17] that alpha particle radiation affects DNA replication, recombination and repair, and, overall, "inhibits DNA synthesis and subsequent mitosis, and causes cell cycle arrest". Chronic inflammation can also be easily predicted on the rate of alpha decay. Oxidative damage as consequence of ionizing radiation exposure is a well-known fact (see for instance [18]). Oxidative stress from "exogenous factors, autoantibody expression, protease activity and the release of pro-inflammatory cytokines" are known to be involved in COPD [14]. The involvement of depleted uranium in Vietnam was shown in [19]. Depleted uranium use in 1972 has been silenced, certainly because although the Vietnamese suffer heavily from the "Christmas bombings", they have a hope to use it for military uses including building a nuclear stockpile. Exposure has been mixed with exposure to chemicals, including the so-called Agent Orange, a mixture of equal parts of 2,4-D and 2,4,5-T. Vietnam veterans exposed to it suffer from a higher frequency of chronic bronchitis, asthma, emphysema or tuberculosis compared with those who did not fight in Vietnam [8]. In addition to DU use, the draft water used to dilute the pesticides can also incorporate potentially a lot of alpha emitters. This explains for instance the famous cases of diseases around areas of pesticide use in the Limousin, the highest natural radioactivity area of France [20]. In [21] is noted as well regarding bronchial asthma genotoxic effects such as "DNA structure damage and cellular apoptosis". Oxidative stress reaction is pointed as the cause of pulmonary damage, but it is clear that these effects are in fact related to alpha decay and to the shuriken effect [22] which is the spin of the fertile alpha emitters under UV radiation [23]. Such processes are also clearly involved in COPD, as it involves direct tissue destruction, mucus hypersecretion, alteration of the vascular barrier function, bronchoconstriction and inflammation [21]. Bose-Einstein condensation of alpha emitters together with their decay products emitting beta radiation can explain bronchoconstriction easily [24] and inflammation is a simple result of alpha decay or shuriken spin. There are sources confirming that summer makes respiratory diseases harder on patients [25] [26]. In fact, all atoms involved (chlorine, bromide, sulfur, nitrogen, and also fluorine through another cation channel) are atoms used for crematory plutogenization, in a pattern relevant to the Kconsolidation given in table 3 of [27], with high numbers indicating a good crematory yield. The possibility of plutogeny in human bodies has been used also medically by Soviet scientists with the drug Arbidol, that includes both nitrogen, bromide and sulfur, with the aim of reducing internal contamination with alpha emitters through neutron capture and fission. Lindane, paraquat and S-metolachlore are examples of pesticides that have been massively used for crematory plutogenization. It is clear that adaptation to crematory plutogenization is a good prohibition criteria. In this regard, it may be asked whether targeting chloride channel with drugs [28] is a good idea or whether it could catch in more alpha emitters – the use should be preventive, before exposure to alpha emitters. The elimination of the exposure to alpha emitters remains a more reliable answer. For instance through neutron capture with rapid neutrons, allowing atoms to lose their shuriken form and trickle down to excretion channels. The water motor with saltwater and an accelerator [29] offers a reliable way to do so, that has been tested as a way to eliminate depleted uranium contamination in the environment. Saltwater fosters neutrons of an intermediary speed that are ideal for neutron capture. This could be very useful to treat lungs, together with complementation with cannabidiol to absorb the pain and cellular damage resulting from fission [30, 31].

References

1. Sinha M, Zabini D, Guntur D, Nagaraj C, Enyedi P. Chloride channels in the lung: Challenges and perspectives for viral infections, pulmonary arterial hypertension, and cystic fibrosis. Pharmacol Ther. 2022; 237: 108249.
2. Pirot F. The link between salt and neurological disorders: the mediation of alpha emitting nanoparticulates as simple explanation. Porto Biomed J. 2019; 4(6): e55.
3. Facts About Cigarette Smoking and Radiation, CDC. 2022.
4. Zaga V, Lygidakis C, Chaouachi K, Gattavecchia E. Polonium and lung cancer. J Oncol. 2011; 860103.
5. Zaga V, Cattaruzza MS, Martucci P. The "Polonium In Vivo" Study: Polonium-210 in Bronchial Lavages of Patients with Suspected Lung Cancer. Biomedicines. 2020; 9(1): 4.
6. Riudavets M, Garcia de Herreros M, Besse B. Radon and Lung Cancer: Current Trends and Future Perspectives. Cancers (Basel). 2022; 14(13): 3142.
7. Health Risk of Radon, US EPA.
8. Mamane A, Baldi I, Tessier JF, Raherison C, Bouvier G. Occupational exposure to pesticides and respiratory health. Eur Respir Rev. 2015; 24(136): 306-19.
9. Tang G, Wu L, Wang R. Interaction of hydrogen sulfide with ion channels. Clin Exp Pharmacol Physiol. 2010; 37(7): 753-63.
10. UniProt, Keywords – Chloride channels.
11. Baliota GV, Athanassiou CG. Use of paraffin oils in agriculture and beyond: back to the future. Environ Sci Pollut Res Int. 2023; 30(2): 2392-2405.
12. Hoppin JA, Valcin M, Henneberger PK, Kullman GJ, Umbach DM. Pesticide use and chronic bronchitis among farmers in the Agricultural Health Study. Am J Ind Med. 2007; 50(12): 969-79.
13. Miller AC, Rivas R, Tesoro L, Kovalenko G. Radiation exposure from depleted uranium: The radiation bystander effect. Toxicol Appl Pharmacol. 2017; 331: 135-141.
14. Parris BA, O'Farrell HE, Fong KM, Yang IA. Chronic obstructive pulmonary disease (COPD) and lung cancer: common pathways for pathogenesis. J Thorac Dis. 2019; 11(Suppl 17): S2155-S2172.
15. Goring L, Schumann S, Muller J. Repair of ▯-particle-induced DNA damage in peripheral blood mononuclear cells after internal ex vivo irradiation with 223Ra. Eur J Nucl Med Mol Imaging. 2022; 49(12): 3981-3988.
16. Nojima H, Kaida A, Matsuya Y, Uo M, Yoshimura RI. DNA damage response in a 2D-culture model by diffusing alpha-emitters radiation therapy (Alpha-DaRT). Sci Rep. 2024; 14(1): 11468.
17. Chauhan V, Howland M, Mendenhall A, O'Hara S. Effects of alpha particle radiation on gene expression in human pulmonary epithelial cells, International Journal of Hygiene and Environmental Health. 2012; 5: 522-535.
18. Yahyapour R, Amini P. Radiation-induced inflammation and autoimmune diseases. Military Med Res. 2018; 5: 9.
19. Pirot F. Glioblastoma in Vietnam War veterans and DU: a major example of brain contamination through inhalation – and general lessons of depleted uranium study and similar issues for nephrology. International Journal of Clinical Nephrology. 2021; 3(1).
20. Pesticides: Medecins Etriverains du Limousin Semobilisent. Allô Docteurs. 2013; 20.
21. Tarmure S, Alexescu TG, Orasan O, Negrean V. Influence of pesticides on respiratory pathology – a literature review. Ann Agric Environ Med. 2020; 27(2): 194-200.
22. Pirot F. The shuriken effect of fertile alpha emitters: a physical process behind findings of chemical toxicity of depleted uranium. International Journal of Nanoparticle Research. 2021; 4: 15.
23. Wilson J, Zuniga MC, Yazzie F. Synergistic cytotoxicity and DNA strand breaks in cells and plasmid DNA exposed to uranyl acetate and ultraviolet radiation. J Appl Toxicol. 2015; 35: 338 ▯ 349.
24. Pirot F. Contamination with Natural Radioactivity and Other Sources of Energy - the Explanation for Bose-Einstein Condensates, for the Creeping Behaviour of Helium and for the "Casimir Effect". International Journal of Physics. 2019; 7(3): 95-96.
25. Common Medical Conditions Aggravated by Sun and Heat. Cedars-Sinai Staff. 2018.
26. The Sun Makes Me Sick: Why I Love a Cloudy Day. COPD Basics. 2024.
27. Grigory S. Interatomic Interactions in Binary Plutonium Compounds. European Journal of Applied Sciences. 2021; 9(4): 85-93.
28. Verkman AS, Galietta LJ. Chloride channels as drug targets. Nat Rev Drug Discov. 2009; 8(2): 153-71.
29. Pirot F. A « Water Motor » With an Accelerator, Water with High Natural Radioactivity and Fission. Int J of Theoretical and Computational Physics. 2022; 3(1): 1-3.
30. Marques Azzini GO, Marques Azzini VO, Santos GS, Visoni S. Cannabidiol for musculoskeletal regenerative medicine. Exp Biol Med (Maywood). 2023; 248(5): 445-455.
31. Gerasymchuk M, Robinson GI, Groves A, Haselhorst L. Phytocannabinoids Stimulate Rejuvenation and Prevent Cellular Senescence in Human Dermal Fibroblasts. Cells. 2022; 11(23): 3939.