Chumbo e câncer

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Um dos importantes motivos da elevada incidência de câncer na atualidade é o aumento da contaminação por metais tóxicos como cádmio, níquel, mercúrio e o chumbo.

O chumbo inorgânico foi classificado como agente carcinogênico provável pela "International Agency for Research on Cancer". Níveis sanguíneos tão baixos quanto 5-9 mcg/dL estão associados com aumento do risco de morte por todas as causas, doença cardiovascular e câncer.

Se descobrimos em um paciente a contaminação por esse metal e o retirarmos do organismo com os procedimentos disponíveis na prática clínica provocaremos diminuição drástica do risco de câncer neste paciente. Estamos falando da verdadeira medicina preventiva.

Outro fato importante: se não retirarmos o chumbo do organismo de paciente com um câncer já diagnosticado, é grande o risco de metástases ou de progressão do câncer inicial.

Todos estes fatos estão descritos na literatura médica, mas os oncologistas não prestam atenção. Os doentes na verdade não devem ser tratados apenas por especialistas, eles necessitam da orientação de um Clínico Geral. Lembrar que o especialista cuida das doenças, o médico biomolecular cuida das células e o verdadeiro médico cuida dos doentes.

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Lead and immune function

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The heavy metal lead is a widely deposited environmental toxicant known to impact numerous physiological systems, including the reproductive, neurological, hepatic, renal, and immune systems. Studies illustrating the capacity of lead to impair immune function and/or host resistance to disease date back to at least the 1960s. However, it has only been in recent years that lead has been recognized among a new category of immunotoxicants-those that dramatically shift immune functional capacity while producing only modest changes to immune cell populations and lymphoid organs. These relatively noncytotoxic immunomodulating chemicals and drugs represent the immunotoxic hazards most difficult to identify and problematic for risk assessment using historic approaches. As a result, such environmental factors are also among the most likely to contribute to chronic immune-related disease at relevant exposure levels. This review considers the animal and human evidence that lead exposure can produce a stark shift in immune functional capacity with a skewing predicted to elevate the risk of atopic and certain autoimmune diseases. At the same time, host defenses against infectious agents and cancer may be reduced. Age-based exposure studies also suggest that levels of blood lead previously thought to be safe, that is, below 10 microg/dl, may be associated with later life immune alterations.

PMID: 16809103

A seguir 20 referências sobre o papel do chumbo no câncer

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[PMID]: 17690218

[Au]: Rousseau MC; Parent ME; Nadon L; Latreille B; Siemiatycki J

[Ti]: Occupational exposure to lead compounds and risk of cancer among men: a population-based case-control study.


[Is]: 0002-9262

[La]: Eng

[A]: The International Agency for Research on Cancer recently classified inorganic lead as a probable carcinogen, while organic lead remained unclassifiable. Uncertainty persists because of limited epidemiologic evidence. The authors addressed the relation between occupational exposure to lead and the risk of 11 types of cancer among men in a case-control study conducted in Montreal, Quebec, Canada, in the 1980s. Incident cases (n = 3,730) and general population controls (n = 533) were interviewed to elicit information on job history and potential confounders. Expert chemists translated each job into a list of substances to which the subject had potentially been exposed. Exposure to lead was classified into three categories: organic lead (3% of subjects ever exposed), inorganic lead (17%), and lead in gasoline emissions (39%). Odds ratios and 95% confidence intervals were estimated by logistic regression using two control groups: general population controls and cancer controls. Stomach cancer was associated with organic lead when the authors used population controls (odds ratio (OR) = 3.0, 95% confidence interval (CI): 1.2, 7.3) and cancer controls (OR = 2.0, 95% CI: 1.1, 3.8) and with substantial exposure to lead in gasoline emissions when they used cancer controls (OR = 2.9, 95% CI: 1.4, 5.9). There was no association with inorganic lead and little evidence for associations with other cancer types.

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[PMID]: 18652229

[Au]: Il'icheva SA; Zaridze DG

[Ti]: [Concerning possible pathways of lead carcinogenicity]


[Is]: 0507-3758

[La]: Rus

3/21

[PMID]: 17718170

[Au]: Parodi S; Gennaro V; Ceppi M; Cocco P

[Ad]: Epidemiology and Biostatistics Section, Scientific Directorate, G. Gaslini Children's Hospital, Genoa, Italy.
Blood lead levels were measured in a nationally representative sample of 13,946 adult participants of the Third National Health and Nutrition Examination Survey recruited in 1988 to 1994 and followed up for up to 12 years for all-cause and cause-specific mortality. OBJECTIVE: Our objective in this study was to determine the risk of mortality in relation to lower blood lead levels observed in adults. METHODS: We analyzed mortality information for 9,757 participants who had a blood lead measurement and who were > or = 40 years of age at the baseline examination. Using blood lead levels categorized as < 5, 5 to < 10, and > or = 10 microg/dL, we determined the relative risk of mortality from all causes, cancer, and cardiovascular disease through Cox proportional hazard regression analysis. RESULTS: Using blood lead levels < 5 microg/dL as the referent, we determined that the relative risk of mortality from all causes was 1.24 [95% confidence interval (CI), 1.05-1.48] for those with blood lead levels of 5-9 microg/dL and 1.59 (95% CI, 1.28-1.98) for those with blood levels > or = 10 microg/dL (p for trend < 0.001). The magnitude of risk was similar for deaths due to cardiovascular disease and cancer, and tests for trend were statistically significant (p < 0.01) for both causes of death. CONCLUSION: In a nationally representative sample of the U.S. population, blood lead levels as low as 5-9 microg/dL were associated with an increased risk of death from all causes, cardiovascular disease, and cancer.

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Blood lead levels and death from all causes, cardiovascular disease, and cancer: results from the NHANES III mortality study.

BACKGROUND: Analyses of mortality data for participants examined in 1976-1980 in the second National Health and Nutrition Examination Survey (NHANES II) suggested an increased risk of mortality at blood lead levels > 20 microg/dL. Blood lead levels have decreased markedly since the late 1970s. In NHANES III, conducted during 1988-1994, few adults had levels > 20 microg/dL. OBJECTIVE: Our objective in this study was to determine the risk of mortality in relation to lower blood lead levels observed for adult participants of NHANES III. METHODS: We analyzed mortality information for 9,757 participants who had a blood lead measurement and who were > or = 40 years of age at the baseline examination. Using blood lead levels categorized as < 5, 5 to < 10, and > or = 10 microg/dL, we determined the relative risk of mortality from all causes, cancer, and cardiovascular disease through Cox proportional hazard regression analysis. RESULTS: Using blood lead levels < 5 microg/dL as the referent, we determined that the relative risk of mortality from all causes was 1.24 [95% confidence interval (CI), 1.05-1.48] for those with blood lead levels of 5-9 microg/dL and 1.59 (95% CI, 1.28-1.98) for those with blood levels > or = 10 microg/dL (p for trend < 0.001). The magnitude of risk was similar for deaths due to cardiovascular disease and cancer, and tests for trend were statistically significant (p < 0.01) for both causes of death. CONCLUSION: In a nationally representative sample of the U.S. population, blood lead levels as low as 5-9 microg/dL were associated with an increased risk of death from all causes, cardiovascular disease, and cancer.
The geometric mean blood lead level in study participants was 0.12 micromol/L (2.58 microg/dL). After multivariate adjustment, the hazard ratios (95% CI) for comparisons of participants in the highest tertile of blood lead (≥ 0.17 micromol/L [≥ 3.62 microg/dL]) with those in the lowest tertile (< 0.09 micromol/L [< 1.94 microg/dL]) were 1.25 (1.04 to 1.51; P(trend) across tertiles = 0.002) for all-cause mortality and 1.55 (1.08 to 2.24; P(trend) across tertiles = 0.003) for cardiovascular mortality. Blood lead level was significantly associated with both myocardial infarction and stroke mortality, and the association was evident at levels > 0.10 micromol/L (< 2 microg/dL). There was no association between blood lead and cancer mortality in this range of exposure. CONCLUSIONS: The association between blood lead levels and increased all-cause and cardiovascular mortality was observed at substantially lower blood lead levels than previously reported. Despite the marked decrease in blood lead levels over the past 3 decades, environmental lead exposures remain a significant determinant of cardiovascular mortality in the general population, constituting a major public health problem.
between amalgam fillings and ill health. The general population is exposed to lead from air and food in roughly equal proportions. During the last century, lead emissions to ambient air have caused considerable pollution, mainly due to lead emissions from petrol. Children are particularly susceptible to lead exposure due to high gastrointestinal uptake and the permeable blood-brain barrier. Blood levels in children should be reduced below the levels so far considered acceptable, recent data indicating that there may be neurotoxic effects of lead at lower levels of exposure than previously anticipated. Although lead in petrol has dramatically decreased over the last decades, thereby reducing environmental exposure, phasing out any remaining uses of lead additives in motor fuels should be encouraged. The use of lead-based paints should be abandoned, and lead should not be used in food containers. In particular, the public should be aware of glazed food containers, which may leach lead into food. Exposure to arsenic is mainly via intake of food and drinking water, food being the most important source in most populations. Long-term exposure to arsenic in drinking-water is mainly related to increased risks of skin cancer, but also some other cancers, as well as other skin lesions such as hyperkeratosis and pigmentation changes. Occupational exposure to arsenic, primarily by inhalation, is causally associated with lung cancer. Clear exposure-response relationships have been observed between exposure and human health. Risks were particularly susceptible to lead exposure due to high gastrointestinal uptake and the permeable blood-brain barrier. Blood levels in children should be reduced below the levels so far considered acceptable, recent data indicating that there may be neurotoxic effects of lead at lower levels of exposure than previously anticipated. Although lead in petrol has dramatically decreased over the last decades, thereby reducing environmental exposure, phasing out any remaining uses of lead additives in motor fuels should be encouraged. The use of lead-based paints should be abandoned, and lead should not be used in food containers. In particular, the public should be aware of glazed food containers, which may leach lead into food. Exposure to arsenic is mainly via intake of food and drinking water, food being the most important source in most populations. Long-term exposure to arsenic in drinking-water is mainly related to increased risks of skin cancer, but also some other cancers, as well as other skin lesions such as hyperkeratosis and pigmentation changes. Occupational exposure to arsenic, primarily by inhalation, is causally associated with lung cancer. Clear exposure-response relationships have been observed.
Causes of pediatric environmental disease are poorly quantified. The costs of pediatric environmental disease are high, in contrast with the limited resources directed to research, tracking, and prevention.

Directed to research, tracking, and prevention.

Recent data indicate that lead can substitute for zinc in several mechanisms of lead carcinogenicity include direct DNA damage, clastogenicity, or inhibition of DNA synthesis or repair. Lead may also be of particular relevance in transplacental exposures and later cancer.

Increased risks of tumorigenesis. In animals, these risks can be induced at doses that are not associated with organ toxicity and in mice increased endogenous lead exposure has been linked to cancer. Women are more affected than men following exposure to methylmercury at adult age, while males seem to be more sensitive to exposure during early development. Regarding arsenic, some data indicate gender differences in the biotransformation by methylating, possibly also in susceptibility to certain arsenic-related cancers. Obviously, gender-related differences in exposure and health effects caused by metals are highly neglected research areas, which need considerable focus in the future.

Spline analyses found no dose response (p = 0.29), and none of the site-specific cancer RRs were significant. Among men, no significant dose-response relationships were found for quartile or spline analyses (p trend = 0.57 and p = 0.38, respectively). Among women, no dose-response relationship was found for quartile analysis (ptrend = 0.22). However, the spline dose-response results were significant (p = 0.001), showing a threshold effect at the 94th percentile of blood lead or a lead concentration of 24 microg/dL, with an RR of 2.4 (95% CI, 1.1-5.2) compared with the risk at 12.5 percentile. Because the dose-response relationship found in women was not found in men, occurred at only the highest levels of lead, and has no clear biologic explanation, further replication of this relationship is needed before it can be considered believable. In conclusion, individuals with blood lead levels in the range of NHANES II do not appear to have increased risk of cancer mortality.

Recent epidemiological and experimental work confirms that inorganic lead compounds are associated with increased risks of tumorigenesis. In animals, these risks can be induced at doses that are not associated with organ toxicity and in mice that do not produce alpha-2 urinary globulin in the kidney. Thus the mechanisms of lead carcinogenicity are unlikely to be fully explained as toxicity-related sequelae of high dose exposure or as a rat-specific response involving overexpression of a renal protein. Plausible mechanisms of lead carcinogenicity include direct DNA damage, clastogenicity, or inhibition of DNA synthesis or repair. Lead may also generate reactive oxygen species and cause oxidative damage to DNA. Recent data indicate that lead can substitute for zinc in several proteins that function as transcriptional regulators, including proteasines. Lead further reduces the binding of these proteins to recognition elements in genomic DNA, which suggests an epigenetic involvement of lead in altered gene expression. These events may be of particular relevance in transplacental exposures and later cancer.
BACKGROUND: Lead is only weakly mutagenic, but in vitro it inhibits DNA repair and acts synergistically with other mutagens. Lead acetate administered orally, cutaneously, or intraperitoneally causes kidney cancer, brain cancer (gliomas), and lung cancer in rodents, and acts synergistically with other carcinogens. Most cytogenetic studies of exposed workers have shown increases in chromosome aberrations or sister chromatid exchange, including some studies with positive-exposure response trends. There are eight studies of cancer mortality or incidence among highly exposed workers; most are cohort studies of lead smelter or battery workers exposed decades ago. METHODS: We reviewed the epidemiologic studies with regard to cancer. RESULTS: These studies provide some evidence of increased risk of lung cancer (RR = 1.30, 1.15-1.46, 675 observed deaths) and stomach cancer (combined RR = 1.14, 1.04-1.73, 405 observed deaths). However, the lung cancer findings are not consistent across studies, and confounding by arsenic may affect the study with the highest lung cancer RR. Exclusion of that study yields a combined lung cancer RR of 1.14 (1.04-1.73). There is little evidence of increased risk of kidney cancer (combined RR = 1.01, 0.72-1.42, 40 observed) or brain cancer (combined RR = 1.06, 0.81-1.40, 69 observed). However, two studies show a two-fold increase in kidney cancer, and one study shows a significant excess of gliomas. IARC classified lead as a [quote]possible human carcinogen[quote] based on sufficient animal data and insufficient human data in 1987. Six of the eight studies cited above have been published since 1987. CONCLUSIONS: Overall, there is only weak evidence associating lead with cancer; the most likely candidates are lung cancer, stomach cancer, and gliomas.

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<td>Titulo</td>
<td>The carcinogenicity of metals in humans.</td>
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Epidemiologic evidence on the relation between exposure to metals and cancer is reviewed. Human exposure to metals is common, with wide use in industry and long-term environmental persistence. Historically, the heaviest metal exposures occurred in the workplace or in environmental settings in close proximity to industrial sources. Among the general population, exposure to a number of metals is widespread but generally at substantially lower levels than have been found in industry. The carcinogenicity of arsenic, chromium, and nickel has been established. Occupational and environmental arsenic exposure is linked to increased lung cancer risk in humans, although experimental studies remain inconclusive. Experimental studies clearly demonstrate the malignant potential of hexavalent (VI) chromium compounds, with solubility being an important determining factor. Epidemiologic studies of workers in chromium chemical production and use link exposure to lung and nasal cancer. Experimental and epidemiologic data show that sparingly-soluble nickel compounds and possibly also the soluble compounds are carcinogens linked to lung and nasal cancer in humans. Some experimental and epidemiologic studies suggest that lead may be a human carcinogen, but the evidence is inconclusive. Although epidemiologic data are less extensive for beryllium and cadmium, the findings in humans of excess cancer risk are supported by the clear demonstration of carcinogenicity in experimental studies. Other metals, including antimony and cobalt, may be human carcinogens, but the experimental and epidemiologic data are limited.

Children today are exposed extensively to toxins in the environment. Prominent among these are exposures to over 70,000 synthetic chemicals, all newly developed in the past 50 years and largely untested for their hazards to children's health. Children are uniquely vulnerable to toxins, and with increasing incidence they are developing chronic, disabling, life-threatening diseases known or suspected to be of environmental origin—asthma, endocrine disruption, cancer, and the diseases caused by tobacco. Pediatricians need to consider toxic etiologies in the differential diagnosis of childhood illness.