Inositol hexafosfato Revisão dos mecanismos anticâncer

O inositol hexafosfato ou ácido fítico (IP6) é rico na natureza, facilmente absorvido pelo trato digestivo e deveria estar na dieta habitual da população mundial não fosse a indústria alimentícia. Ele encontra-se em abundância nos cereais integrais, nas nozes, nos óleos não hidrogenados como aqueles de Super mercado, em legumes sem agrotóxicos e na soja e seus derivados os quais não devemos abusar pelo alto conteúdo em oxalato que diminui a memória e a concentração.

O IP6 além de antiproliferativo e apoptótico aumenta a diferenciação de células neoplásicas provocando a reversão para um fenótipo normal. Ele aumenta a imunidade e possui efeitos antioxidantes. O IP6 funciona melhor quando administrado junto com o inositol e desta forma aumenta a eficácia da quimioterapia convencional e controla melhor as metástases. Trabalho piloto mostrou melhora da qualidade de vida.

Ácido fítico = mio-inositol-hexafosfato = di-hidrogênio fosfato = C6H14O24P6
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Inositol phosphates have novel anticancer function.

Shamsuddin AM. J Nutr. 1995 Mar;125(3 Suppl):725S-732S.
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Abstract

Inositol hexaphosphate (InsP6, phytic acid) is ubiquitous in the plant kingdom and is abundant in cereals and legumes. In much smaller amounts InsP6 and its lower phosphorylated forms (InsP1-5) are contained in most mammalian cells, where they are important in regulating vital cellular functions. Both in vivo and in vitro experiments have suggested striking anticancer potential (preventive as well as therapeutic) for InsP6 with and without inositol. In addition to reduce cell proliferation, InsP6 increases differentiation of malignant cells often resulting in reversion to the normal phenotype. InsP6 is quickly absorbed from the rat stomach and upper intestine and distributed as inositol and InsP1. In vitro it is instantaneously taken up by malignant cells undergoing variable dephosphorylation to inositol and InsP1-5. In vivo it is distributed as inositol and InsP1-5, pointing toward their role in mediating the action of InsP6. Because InsP6 is high in high-fiber diets, our studies also may explain, at least in part, the epidemiologic observation showing high-fiber diets are associated with a lower incidence of certain cancers. Although further studies are needed to elucidate the mechanism(s) of this action, inclusion of InsP6 in our strategies for cancer prevention and therapy is warranted.

PMID: 7884558


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Abstract

Inositol hexaphosphate (InsP6 or IP6) is ubiquitous. At 10 micromolar to 1 mM concentrations, IP6 and its lower phosphorylated forms (IP(1-5)) as well as inositol (Ins) are contained in most mammalian cells, wherein they are important in regulating vital cellular functions such as signal transduction, cell proliferation and differentiation. A striking anti-cancer action of IP6 has been demonstrated both in vivo and in vitro, which is based on the hypotheses that exogenously administered IP6 may be internalized, dephosphorylated to IP(1-5), and inhibit cell growth. There is additional evidence that Ins alone may further enhance the anti-cancer effect of IP6. Besides decreasing cellular proliferation, IP6 also causes differentiation of malignant cells often resulting in a reversion to normal phenotype. These data strongly point towards the involvement of signal transduction pathways, cell cycle regulatory genes, differentiation genes, oncogenes and perhaps, tumor suppressor genes in bringing about the observed anti-neoplastic action of IP6.

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Cancer inhibition by inositol hexaphosphate (IP6) and inositol: from laboratory to clinic. Review

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Abstract

Inositol hexaphosphate (IP6) is a naturally occurring polyphosphorylated carbohydrate that is present in substantial amounts in almost all plant and mammalian cells. It was recently recognized to possess multiple biological functions. A striking anticancer effect of IP6 was demonstrated in different experimental models. Inositol is also a natural constituent possessing moderate anticancer activity. The most consistent and best anticancer results were obtained from the combination of IP6 plus inositol. In addition to reducing cell proliferation, IP6 increases differentiation of malignant cells, often resulting in a reversion to normal phenotype. Exogenously administered IP6 is rapidly taken into the cells and dephosphorylated to lower-phosphate inositol phosphates, which further interfere with signal transduction pathways and cell cycle arrest. Enhanced immunity and antioxidant properties can also contribute to tumor cell destruction. However, the molecular mechanisms underlying this anticancer action are not fully understood. Because it is abundantly present in regular diet, efficiently absorbed from the gastrointestinal tract, and safe, IP6 holds great promise in our strategies for the prevention and treatment of cancer. IP6 plus inositol enhances the anticancer effect of conventional chemotherapy, controls cancer metastases, and improves the quality of life, as shown in a pilot clinical trial. The data strongly argue for the use of IP6 plus inositol in our strategies for cancer prevention and treatment. However, the effectiveness and safety of IP6 plus inositol at therapeutic doses needs to be determined in phase I and phase II clinical trials in humans.

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Inositol hexaphosphate (InsP6, phytic acid) is ubiquitous in the plant kingdom and is abundant in cereals and legumes. In much smaller amounts InsP6 and its lower phosphorylated forms (InsP1-5) are contained in most mammalian cells, where they are important in regulating vital cellular functions. Both in vivo and in vitro experiments have suggested striking anticancer potential (preventive as well as therapeutic) for InsP6 with and without inositol. In addition to reduce cell proliferation, InsP6 increases differentiation of malignant cells often resulting in reversion to the normal phenotype. InsP6 is quickly absorbed from the rat stomach and upper intestine and distributed as inositol and InsP1. In vitro it is instantaneously taken up by malignant cells undergoing variable dephosphorylation to inositol and InsP1-5, pointing toward their role in mediating the action of InsP6. Because InsP6 is high in high-fiber diets, our studies also may explain, at least in part, the epidemiologic observation showing high-fiber diets are associated with a lower incidence of certain cancers. Although further studies are needed to elucidate the mechanism(s) of this action, inclusion of InsP6 in our strategies for cancer prevention and therapy is warranted.

PMID: 7884558

Protection against cancer by dietary IP6 and inositol.

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Inositol hexaphosphate (IP(6)) is a naturally occurring polyphosphorylated carbohydrate, abundantly present in many plant sources and in certain high-fiber diets, such as cereals and legumes. In addition to being found in plants, IP(6) is contained in almost all mammalian cells, although in much smaller amounts, where it is important in regulating vital cellular functions such as signal transduction, cell proliferation, and differentiation. For a long time IP(6) has been recognized as a natural antioxidant. Recently IP(6) has received much attention for its role in cancer prevention and control of experimental tumor growth, progression, and metastasis. In addition, IP(6) possesses other significant benefits for human health, such as the ability to enhance immune system, prevent pathological calcification and kidney stone formation, lower elevated serum cholesterol, and reduce pathological platelet activity. In this review we show the efficacy and discuss some of the molecular mechanisms that govern the action of this dietary agent. Exogenously administered IP(6) is rapidly taken up into cells and dephosphorylated to lower inositol phosphates, which further affect signal transduction pathways resulting in cell cycle arrest. A striking anticancer action of IP(6) was demonstrated in different experimental models. In addition to reducing cell proliferation, IP(6) also induces differentiation of malignant cells. Enhanced immunity and antioxidant properties also contribute to tumor cell destruction. Preliminary studies in humans show that IP(6) and inositol, the precursor molecule of IP(6), appear to enhance the anticancer effect of conventional chemotherapy, control cancer metastases, and improve quality of life. Because it is abundantly present in regular diet, efficiently absorbed from the gastrointestinal tract, and safe, IP(6) + inositol holds great promise in our strategies for cancer prevention and therapy. There is clearly enough evidence to justify the initiation of full-scale clinical trials in humans.

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