

Dr. Joseph Varon - Research Inquiry #17

Ivermectin for Myxoid Liposarcoma | 10.04.2024

Research Inquiry

What is the role of ivermectin in treating myxoid sarcomas?

Conclusion

- **The literature review did not yield any evidence regarding the effectiveness of ivermectin in treating myxoid sarcoma.**
- **Additionally, the National Cancer Institute (NCI) has declared that available data does not support using ivermectin as an effective therapy for cancer.**
- **Ivermectin's major side effects include headache, somnolence, myalgia, and rare transient proteinuria. No side effects concerning thyroid functions or increased diuresis have been found.**
- **Co-administration of ivermectin and Larotrectinib (recommended in the guidelines for Liposarcoma treatment) may cause an increase in serum ivermectin levels, necessitating careful monitoring during administration.**

Important Note - Neither the services nor the research report constitute medical advice of any kind and are not intended to be a substitute for professional medical advice.

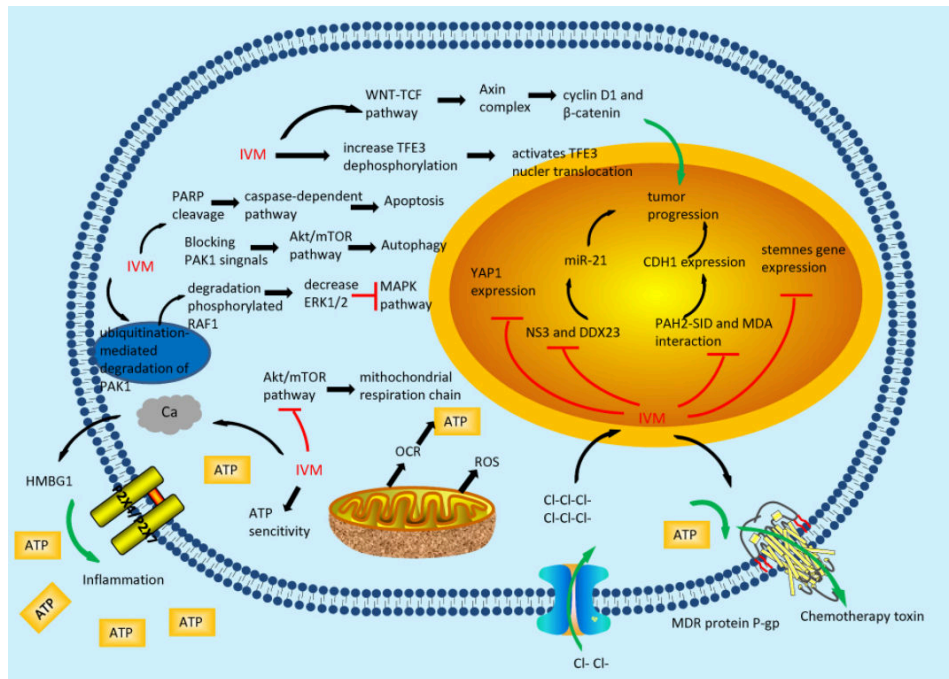
Meta Medical Findings

Introduction

Ivermectin (IVM) is primarily known for its broad-spectrum antiparasitic properties but has recently been investigated for its potential anticancer activities^{[1] [2]}.

Ivermectin inhibits ATP-dependent efflux pumps which are considered to be key players in resistance of anti-neoplastic drugs. In Addition, it causes an elevation of intracellular reactive oxygen species leading to oxidative stress and DNA damage.

The ivermectin mechanism of action also disrupts key signaling pathways such as AKT/mTOR and Wnt/TCF. Moreover, ivermectin has been shown to induce the degradation of PAK-1, an oncogenic kinase implicated in tumorigenesis^[3].



Liu et al., 2019, an illustration of the genetic pathways impacted by ivermectin

According to FDA guidelines, ivermectin is not indicated for the treatment of malignancies^[4]. Furthermore, in response to claims on social media proposing ivermectin as a cancer cure, the National Cancer Institute (NCI) has clarified that their comprehensive review of available data does not support the notion that it is an effective cure for cancer^[5].

Efficacy of ivermectin

The literature review conducted in this research did not yield any evidence regarding the effectiveness of ivermectin in treating myxoid sarcoma.

Moreover, data about ivermectin's efficacy in other malignancies is limited to three case reports^[6]. Out of those case reports, only one patient received ivermectin for non-myxoid sarcoma (osteosarcoma):

The case report published by Cureus (no JCR rating, Impact Factor 1.2) in 2022^[6], describes a 54-year-old male diagnosed with osteosarcoma of the right femur in February 2021. Despite undergoing neoadjuvant chemotherapy with adriamycin and ifosfamide and subsequent tumor resection, he experienced local recurrence. Due to breathlessness and intense pain, the patient was confined to his home. He was treated with a clinical trial regimen of dichloroacetate, omeprazole, and tamoxifen that proved ineffective, leading to the introduction of ivermectin. The modified treatment plan included weekly administration of dichloroacetate, omeprazole, tamoxifen, and ivermectin. After one treatment cycle, the patient showed significant symptomatic improvement, regaining the ability to walk and visit the clinic independently.

Safety of ivermectin

The safety of ivermectin was reviewed in two perspectives: general side effects and drug interactions, with a primary focus on the potential medication regimens for the treatment of liposarcoma^[7].

Possible side effects:^{[8] [9] [10]}

System	Possible side effects
Renal*	Rare transient proteinuria.
Cardiovascular	Tachycardia and orthostatic hypotension. ECG changes, including prolonged PR interval, flattened T waves, and peaked T waves, have been reported in single cases.
Respiratory	Worsening bronchial asthma, laryngeal edema, and dyspnea.
Nervous system	Dizziness, headache, somnolence, vertigo, and tremor. Seizures have been reported during postmarketing experience.
Musculoskeletal	Myalgia
Ocular	Eyelid edema, anterior uveitis, blurred vision, conjunctivitis, limbitis, punctate opacity, keratitis, abnormal eye sensation, Conjunctival hemorrhage, and chorioretinitis/choroiditis. <u>It is important to mention that those side effects are associated also with onchocerciasis, a parasitic disease ivermectin is indicated for.</u>

ECG = Electrocardiography

Patient history-related side effects:

- No side effects concerning thyroid function have been found.
- Ivermectin has not been found to be associated with increased diuresis.

Drug interactions

Drug	Possible interaction	Management
Larotrectinib ^[11]	Co-administration with larotrectinib may increase the plasma concentrations of drug substrates of the CYP450 3A4 isoenzyme, such as ivermectin.	Dosage adjustments as well as clinical and laboratory monitoring may be appropriate.

Our review of the literature did not yield any further drug interactions relating treatment of myxoid sarcoma.

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