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THERAPEUTIC EFFICACY OF ABRAXANE

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ABSTRACT

This article is related to therapeutic efficiency of ABRAXANE. ABRAXANE is a antitumor agent which is having hydrophobic nature, to overcome this property lipid based solvents are added as vehicles. ABRAXANE is the albumin-bounded 130° nanometer particle formulation paclitaxel. Since the standard dose of paclitaxel has lower incidences of toxicities, it is used in different types of malignant tumors. In the phase-III clinical trials nab – paclitaxel demonstrated higher response rates, better safety and side effects profile. Compared to conventional paclitaxel and improved survival in patients receiving it as second line therapy. ABRAXANE as superior efficacy to eliminate CSC's in comparison with TAXOLS. The pharmacokinetic data of 260mg /m^2 of ABRAXANE administered over 30 minutes was compared with pharmacokinetic data of 175mg/m^2 of paclitaxel injection over 3 hours. The volume of distribution of ABRAXANE was higher (53%) than paclitaxel and the volume of clearance of ABRAXANE was found to be larger (43%) than paclitaxel injection.

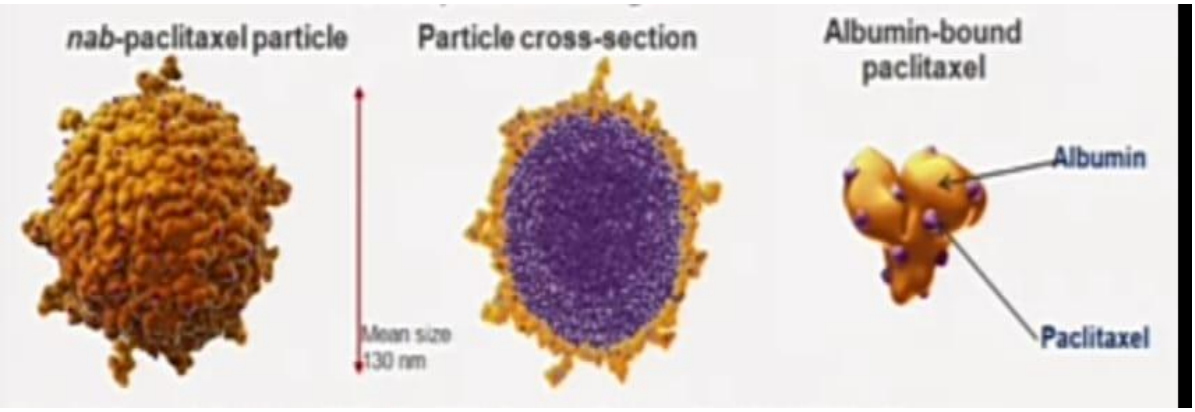
KEYWORDS: Abraxane, Paclitaxel, Tumor, Efficacy.

INTRODUCTION

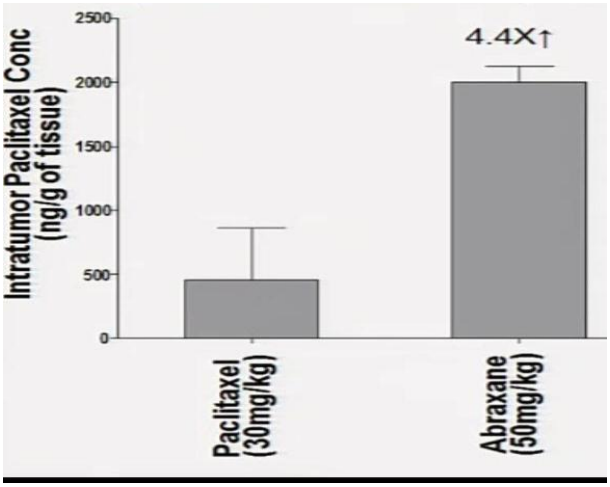
ABRAXANE is the chemotherapeutic agent that is widely used in malignant tumors like Metastatic breast cancer, Non -small cell lung cancer & Metastatic pancreatic cancer.In metastatic pancreatic cancer ABRAXANE is given in combination with gemcitabine, ABRAXANE doesn't have any solvents unlike paclitaxel which make taxol difficult to tolerate. Here the comparison between pathological complete response and survival rate of the patients was measured to know the therapeutic efficacy of ABRAXANE.

Mechanism of action

ABRAXANE is the albumin based medicine in which the drug paclitaxel is coated with albumin as shown.



This drug is approved in metastatic breast cancer, Non-small cell lung cancer and metastasis pancreatic cancer. These tumors commonly caused by gene inheritance. The reason for the better therapeutic effect of ABRAXANE is that it contains albumin, this albumin is accumulated in the tumor cell due to different reasons like transcytosis across the endothelial cells and also albumin is used as nutritional source in tumor cells. When the person injected with this drug the particle breaks down into albumin bound paclitaxel and form caveolae. This formation of caveolae is triggered by albumin, this caveolae contains small drug particles that is transported from one site to another and further from lumen of the blood vessels to tissue site. The accumulation of the drug ABRAXANE at tumor tissue site is more when compared to taxol.

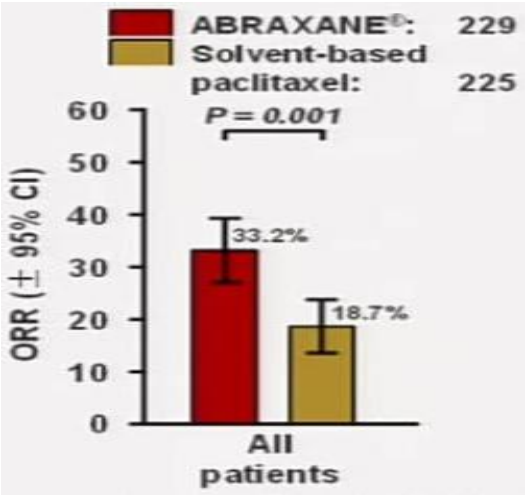


In case of Non – Small cell lung cancer the conventional treatment was the combination of paclitaxel with carboplatin. The patients above 70 years of age have 10 months of survival rate when treated with paclitaxel and 20 months of survival rate when treated with ABRAXANE

In case of metastatic pancreatic cancer the gemcitabine was used as standard drug but there was no improvement in survival rate but after a the therapy with ABRAXANE the survival rate was found to be 2 months.

This drug ABRAXANE is neo- adjuvent which means the treatment prior to the surgery, this neo- adjuvent therapy helps in reducing the size of tumor and then the person is subjected to the surgery like lumpectomy. After 24 hours of drug administration the pathological complete response (PCR) rate is measured to know the tumor size.

The over all response rate of the solvent- based paclitaxel versus ABRAXANE is shown.



In metastatic melanoma darbazine was the previous standard treatment, after a period of time ABRAXANE was use to treat melanoma, the therapeutic effect with ABRAXANE was better when compare to dacarbazine.

Administration

You have nab-paclitaxel as a drip into your bloodstream (intravenously). It works by stopping the separation of cancer cell into two new cells, hence it stops the growth of cancer cells.

A cannula with a long plastic tube is put into one of your veins which connects the drip to it, the drugs are given into a large vein either in your chest or through a vein 8n your arm (which stays for a few months).

Depending on the type on cancer, nab- paclitaxel treatment is given once a week for 3 weeks or for every 3 weeks.

Indications

1. In pregnancy patients ABRAXANE was contraindicated
2. Excretion of the drug ABRAXANE inhuman milk is not known
3. Safety and effectiveness of in pediatrics is not evaluated
4. In hepatic impairment the ABRAXANE is administered with caution

Pharmacokinetic

Parameters	Values
Absorption	T_{max}, IV: end of infusion
Time to Peak	Near end of infusion
Volume of Distribution	632 L/m² (based on dose of 260 mg/m²)
Protein binding	89% to 98%
Metabolism	Primarily hepatic metabolism via CYP2C8
Half-life Elimination	Approximately 27 hours

Drug interactions

ABRAXANE is metabolized by CYP2C8 and CYP3A4 use caution when administered concomitantly with medicines known to inhibit or induce either CYP2C8 and CYP3A4 enzymes.

Contraindications

- Should not be used in patients with neutrophils count <1500 cell /mm3
- Frequent peripheral blood cell count should be performed in all patients using ABRAXANE
- Patient experiencing sever hypersensitivity should not be re-challenged

Warnings and Precautions

Haematologic effects

- Bone marrow suppression is dose dependent and dose limiting toxicity of ABRAXANE
- Monitor the myelotoxicity by performing CBC counts as in pancreatic cancer is recommended
- Resume the treatment with appropriate dose reduction if recommended

Other warnings

- Monitor signs and symptoms of pneumonitis after ruling out infectious etiology then permanently discontinue the treatment
- Exposure and toxicity of paclitaxel can be increased with hepatic impairment , monitor hepatic functions at base line and throughout the course of treatment
- Administration in pregnancy women can cause embryo- foetal toxicity

Storage

Store the vials in the original cartons at 20°c – 25°c (68-77° F)

It should be protected from bright light

CONCLUSION

From all the references I mentioned, I conclude that ABRAXANE has more efficacy when used in the treatment of malignant tumors than compared to taxols.

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