

Dabrafenib and Trametinib (NSCLC)

Indication

First line treatment of BRAF V600 mutation-positive advanced non-small-cell lung cancer.

(NICE TA898)

ICD-10 codes

Codes with a prefix C34

Regimen details

Day	Drug	Dose	Route
1-28	Dabrafenib	150mg BD	PO
1-28	Trametinib	2mg OD	PO

Cycle frequency

Continuous

Number of cycles

Continuous until disease progression or unacceptable toxicity.

Administration

Dabrafenib is available as 75mg and 50mg capsules.

Dabrafenib should be taken at least one hour before or two hours after food. Doses should be taken 12 hours apart, swallowed whole with water, not chewed or crushed.

Grapefruit and grapefruit juice should be **avoided** whilst taking dabrafenib.

If a dose is missed it should be taken if it is more than six hours until the next dose is due. If within six hours the dose should be missed and the next dose taken as planned. Doses should be taken at similar times every day. If the patient vomits an additional dose should not be taken but the next dose taken as usual.

Trametinib is available as 0.5mg and 2mg tablets.

Trametinib should be taken once a day, at the same time each day (with either the morning or evening dabrafenib dose), at least one hour before or two hours after a meal. The tablets should be swallowed whole with a full glass of water.

If a dose is missed it should be taken if it is more than 12 hours until the next dose is due.

Pre-medication

Nil

Emetogenicity

This regimen has mild emetic potential.

Additional supportive medication

Emollients if required.

Antiemetics if required.

Extravasation

N/A

Investigations – pre first cycle

Investigation	Validity period (or as per local policy)
FBC	14 days
U+E (including creatinine)*	14 days
LFTs	14 days
Magnesium	14 days
Calcium	14 days
Pregnancy test (if applicable)	7 days
Blood pressure	Baseline
ECG (QTc < 500ms)	Baseline

*Electrolyte imbalances must be corrected before treatment is commenced.

Consider baseline echocardiogram if pre-existing cardiac co-morbidity

Consider dermatological evaluation.

Investigations – pre subsequent cycles

Patients should be reviewed every 4 weeks for the first 3 months.

Investigation	Validity period (or as per local policy)
FBC	After 2 weeks then monthly
U+E (including creatinine)	After 2 weeks then monthly
LFTs	After 2 weeks then monthly
Magnesium	After 2 weeks then monthly
Blood pressure	Monthly
ECG	Should be monitored before treatment, after the first month, then approximately 3 monthly and after any dose modifications*

Cardiac monitoring with an ECHO if clinically appropriate.

Standard limits for administration to go ahead

If blood results not within range, authorisation to administer **must** be given by prescriber/ consultant

Investigation	Limit
Neutrophils	$\geq 1.0 \times 10^9/L$
Platelets	$\geq 100 \times 10^9/L$
Creatinine clearance (CrCl)	$\geq 30ml/min$
AST/ALT	$\leq 2.5 \times ULN$ (or $<5 \times ULN$ if liver metastases)
Bilirubin	$\leq 1.5 \times ULN$
QTc	$< 500ms$ and $<60ms$ increase from baseline

Dose modifications

Dose modifications should be made as per the table below:

Dose level	Dabrafenib dose	Trametinib dose
Full dose	150mg BD	2mg OD
First reduction	100mg BD	1.5mg OD
Second reduction	75mg BD	1mg OD
Third reduction	50mg BD	Discontinue if unable to tolerate 1mg OD

Dose reductions beyond these levels are not recommended.

- **Haematological toxicity**

See below for management of pyrexia.

- **Renal impairment**

Limited data available. No dose reduction necessary for mild to moderate renal impairment. Use with caution and closely monitor if severe renal impairment.

- **Hepatic impairment**

No dose modification is required for mild hepatic impairment. There is no data in moderate to severe hepatic impairment. Dabrafenib and trametinib should be used with caution and consider dosing at 50%.

- **Other toxicities**

QT prolongation:

If the QTc exceeds 500 msec, both dabrafenib and trametinib should be temporarily interrupted, electrolyte abnormalities (including magnesium) should be corrected, and cardiac risk factors for QT prolongation (e.g. congestive heart failure, bradyarrhythmias) should be controlled. Re-initiation of treatment should occur once the QTc decreases below 500 msec with a one level dose reduction of dabrafenib. No dose reduction is required for trametinib.

Permanent discontinuation of dabrafenib and trametinib treatment is recommended if the QTc increase meets values of both > 500 msec and > 60 msec change from pre-treatment values.

Hypertension:

Hypertension should be controlled with standard antihypertensives.

Reduction in LVEF:

If LVEF decreases by > 10% from baseline or is below LLN for the institution, trametinib should be withheld. If LVEF recovers trametinib may be restarted with one dose level reduction and close monitoring. No dose reduction is required for dabrafenib.

If grade 3-4 left ventricular cardiac dysfunction or if LVEF does not recover within 4 weeks trametinib should be permanently discontinued.

Pyrexia:

Dabrafenib should be interrupted if the patient's temperature is $\geq 38^{\circ}\text{C}$. Patients should be evaluated for signs and symptoms of infection. If infection is excluded, dabrafenib may be restarted once the fever resolves with appropriate prophylaxis using non-steroidal anti-inflammatory medicinal products or paracetamol. If fever is associated with other severe signs or symptoms oral corticosteroids may be required and dabrafenib should be restarted at a reduced dose once fever resolved.

Trametinib may be continued.

Uveitis:

If inflammation is controlled with local therapies no dose modifications are required. If uveitis does not respond to local therapy withhold dabrafenib until resolution and restart at reduced dose on resolution. No dose modification of trametinib is required.

Ocular toxicity:

Patients should be encouraged to report visual disturbances and ophthalmological assessment is recommended if symptoms reported.

Retinal pigment epithelial detachment:

Grade 1: continue and monitor monthly until resolved.

Grade 2-3: withhold trametinib for up to 3 weeks. If resolves to \leq grade 1 restart at reduced dose, if not permanently discontinue.

Dabrafenib may be continued.

Retinal vein occlusion: Permanently discontinue trametinib.
Dabrafenib may be continued.

Pneumonitis:

Trametinib should be withheld if pneumonitis is suspected and must be permanently discontinued if treatment-related pneumonitis is diagnosed.

Dabrafenib may be continued.

Skin tumours:

Cases of skin squamous cell carcinomas should be treated with surgical excision. No dose adjustment is required. Dermatological evaluation should continue for 6 months after the cessation of treatment.

Severe cutaneous adverse reactions:

Cases of Stevens-Johnson syndrome and drug reaction with eosinophilia and systemic symptoms (DRESS) have been reported. Patients should be advised of signs and symptoms and monitored closely for skin reactions. If symptoms suggestive of severe cutaneous adverse reactions occur, treatment should be discontinued.

Any other toxicities:

Toxicity grade	Dose modification
Grade 1 or 2 (tolerable)	Continue treatment and monitor
Grade 2 (intolerable) or Grade 3	Interrupt treatment until \leq Grade 1. Resume with dose reduction of one level.
Grade 4	Discontinue or interrupt treatment until \leq Grade 1. Resume with dose reduction of one level. or Permanently discontinue treatment.

Adverse effects - for full details consult product literature/ reference texts

• **Serious side effects**

- Cutaneous squamous cell carcinoma
- Non-cutaneous squamous cell carcinoma
- New primary melanoma
- QT prolongation
- Pancreatitis
- Hypersensitivity reactions
- Ophthalmic reactions, including uveitis
- Myelosuppression
- Renal failure
- Colitis, GI perforation
- Haemophagocytic lymphohistiocytosis
- Left ventricular dysfunction

• **Frequently occurring side effects**

- Pyrexia
- Fatigue
- Fever, chills
- Headache
- Cough
- Arthralgia, myalgia
- Rash, pruritus
- Hyperkeratosis
- Nausea and vomiting

Diarrhoea
Alopecia
Raised LFTs
Hypertension

- **Other side effects**

Hypophosphataemia
Hyperglycaemia

Significant drug interactions – for full details consult product literature/ reference texts

Coumarin anticoagulants (e.g. warfarin): avoid, reduced warfarin exposure.

Dabrafenib

Medication which prolong the QT interval: Concomitant use not recommended as dabrafenib may prolong QT interval.

Inducers of CYP3A4/CYP2C8 (e.g. rifampicin, phenytoin, carbamazepine, St Johns Wort, gemfibrozil): avoid co-administration as these may reduce exposure to dabrafenib.

Inhibitors of CYP3A4/CYP2C8 (e.g. ritonavir, saquinavir, telithromycin, ketoconazole, itraconazole, voriconazole, posaconazole, nefazodone, atazanavir): use with caution, increased risk of toxicity.

Contraceptive pill: efficacy may be reduced.

Digoxin: concomitant use may reduce digoxin levels.

There is a theoretical risk that drugs which raise gastric pH may decrease dabrafenib bioavailability.

Dabrafenib can interact with many medicinal products eliminated through metabolism or active transport. If their therapeutic effect is of large importance to the patient, and dose adjustments are not easily performed based on monitoring of efficacy or plasma concentrations, these medicinal products are to be avoided or used with caution. Please see the SPC for a full list of potential medicinal interactions.

Trametinib

As trametinib is metabolised predominantly via deacetylation mediated by hydrolytic enzymes (e.g. carboxyl-esterases), its pharmacokinetics are unlikely to be affected by other agents through metabolic interactions. Drug-drug interactions via these hydrolytic enzymes cannot be ruled out and could influence the exposure to trametinib.

Strong P-gp inhibitors (e.g. verapamil, cyclosporine, ritonavir, quinidine, itraconazole): caution is advised when co-administering trametinib; strong inhibition of hepatic P-gp may result in increased levels of trametinib.

BCRP substrates (e.g. pitavastatin): staggered dosing (2 hours apart) of these agents and trametinib due to risk of transient inhibition of BCRP substrates.

Additional comments

Women of child bearing potential must be advised to use adequate contraception throughout treatment.

References

- National Institute for Health and Clinical Excellence. NICE Technology Appraisal Guidance 898 accessed 25 January 2024 via www.nice.org.uk
- Summary of Product Characteristics – Dabrafenib (Novartis) accessed 25 January 2024 via www.medicines.org.uk
- Summary of Product Characteristics – Trametinib (Novartis) accessed 25 January 2024 via www.medicines.org.uk
- Planchard, D. et al. Dabrafenib plus trametinib in patients with previously untreated BRAF V600E-mutant non-small-cell lung cancer: an open-label, phase 2 trial. *Lancet Oncology*. 18(10):1307-1316.

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