**Ajmaline for the Diagnosis of Brugada Syndrome**

Brugada syndrome is a congenital disorder affecting myocardial sodium channels and may be associated with sudden cardiac death. Ajmaline is a class 1a antiarrhythmic that blocks the sodium channel and is used in the diagnosis of Brugada syndrome. Ajmaline has a short half-life allowing it to be used for daycase. **It is unlicensed in the UK and must therefore only be used under the direction of an Electrophysiology consultant**.

The test must be undertaken with continuous ECG monitoring and blood pressure control. Resuscitative equipment must be immediately available.

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| **Contraindications** | **Cautions** |
| * Resting type I Brugada pattern on ECG * Myocardial infarction in last 3/12 * Liver disease * Myasthenia gravis * Hypertrophic Cardiomyopathy * Tachycardia due to cardiac decompensation * Digitalis toxicity * Hypersensitivity to ajmaline * Pre-existing ventricular conduction disorders (unless life threatening as determined by consultant) * Bradycardia, 2nd or 3rd degree AV block * LVEF < 35% * Significant widening of QRS duration or QT interval * Pregnancy/ Breast Feeding | * Bundle branch block * Sick sinus syndrome * AV nodal block * Non-rhythmogenic hypotension (<90mmHg) * Paediatric patients * Cholestatic jaundice |

**Before the test record baseline ECG and blood pressure**

Review the rhythm, measure QRS duration, the Q-T interval and ST elevation in leads V1 – V3.

Ensure patient fasted (6 hours food, 2 hours clear fluids).

Weigh the patient.

**In case of emergency the following drugs must be available:**

* isoprenaline (from cath lab), atropine, magnesium

Start continuous 12 lead ECG monitoring

**Dosing and Administration of Ajmaline:**

**Administration via a cardiology consultant or registrar only**

Ajmaline is presented as a 50mg / 10ml ampoule.

**Dose:** 10mg every 2 minutes until target dose of 1mg/kg (with a maximum total dose of 80mg) has been given.

**Administration**: Each 10mg dose should be administered as a slow bolus over one minute.

Check ECG and observations after each bolus.

**Drug administration should stop** as soon as diagnostic criteria for Brugada syndrome have been met (to minimise adverse effects) or if patient develops accentuated RBBB, prolonged P-Q > 50% of baseline or second or third degree AV block, prolonged QRS duration > 30% from baseline, hyper-elevation of ST segment or if develops premature ventricular beats or VT / VF occur.

**Following drug administration check the ECG 10 minutes post procedure. Cardiac monitoring for a further 50 minutes.**

**Adverse Events of Ajmaline**

* Possible to precipitate VT or spontaneous VF
* Ventricular premature complexes have been observed where marked ST elevation has developed early – limit dose administered
* Pro-arrhythmic in non-Brugada patients
* Administration can make VT / VF more difficult to treat
* Lengthening QRS duration, QT interval, PQ interval and hyper-elevation of ST segment
* Development of HF
* If in atrial fibrillation or flutter – ajmaline can increase ventricular rate
* Sinus bradycardia, SA block, inhibition of intraventricular conduction
* Hypotension
* Seizures
* Respiratory arrest/depression
* Flushing
* Parasthesia
* Nausea and vomiting / appetite loss post-procedure
* Diarrhoea post-procedure
* Hepatoxicity and agranulocytosis
* Eye twitching
* Decreased urine output
* Cyanosis and skin mottling can develop in cardiogenic shock

**Management of Ventricular arrhythmias - Isoprenaline**

Add 200 micrograms of isoprenaline to a 100ml bag of dextrose 5%.

Start infusion at 0.5 micrograms/minute and titrate up as required.

**PLEASE NOTE THERE ARE TWO ISOPRENALINE PREPARATIONS AVAILABLE HYDROCHLORIDE AND SULPHATE.**

Isoprenaline sulfate 1.125mg = isoprenaline hydrochloride 1mg.  
  
Refer to the medusa monograph for specific information on each salt

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| --- | --- |
| Dose  (micrograms/minute) | Infusion rate (ml/hour)  ISOPRENALINE  200 micrograms in 100mls |
| 0.5 micrograms/minute | 15 |
| 1 microgram/minute | 30 |
| 2 microgram/minute | 60 |
| 3 microgram/minute | 90 |
| 4 microgram/minute | 120 |

Infusion bag is stable for 24 hours once made up

Isoprenaline has a low pH and may cause venous irritation and tissue damage in cases of extravasation.

Flush line with sodium chloride 0.9% or glucose 5%

**Adverse effects of isoprenaline:**

* Tachycardia,
* Cardiac arrhythmias,
* Palpitations,
* Hypotension,
* Tremor,
* Headache,
* Sweating and facial flushing.

**Monitoring for isoprenaline:**

* ECG,
* Heart rate,
* Cardiac output.

**References:**

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Medusa is available via pharmacy page on the intranet