Acute kidney injury and sick day rules/guidance: implications for patients with chronic heart failure – a statement from the BSH Board

Reporting of acute kidney injury (AKI) is now routine practice within biochemistry laboratories in the UK. Results will be flagged as part of a major NHS campaign in an attempt to improve the care of people at risk of, or with, AKI. Focus on AKI has arisen from its well-documented association with adverse outcomes in large population studies. More background data can be found on the 'Think Kidneys' website: www.thinkkidneys.nhs.uk. On the basis of this, many localities have introduced, or are in the process of introducing, AKI pathways and sick day rules/guidance. The premise here is that interventions directed towards these high risk patients will improve their clinical outcome.

Inevitably such pathways will have an impact on the management of patients with chronic heart failure. The Board of the British Society for Heart Failure (BSH) has discussed a number of concerns arising from the members' own experiences and also the available literature. We thought it valuable to share our concerns, so members involved in local discussion might use them. We also welcome feedback from any members in this respect.

Angiotensin converting enzyme inhibitors (ACEi) or angiotensin receptor blockers (ARB) are established disease-modifying drugs in the management of chronic heart failure (left ventricular systolic dysfunction), associated with major prognostic benefit. They represent first line treatment in all major guidelines for the management of chronic heart failure. These drugs do affect renal haemodynamics and some deterioration in renal function is common as they are commenced in patients with heart failure. However, they are not nephrotoxins. The Board of the BSH feels strongly that they should not be misinterpreted as such. It is vital that any local information/pathways relating to AKI make it absolutely clear that these drugs are not nephrotoxic.

Sick day rules/guidance are local initiatives providing healthcare professionals and/or patients with recommendations on what to do if a patient taking drugs that might impact on renal function such as NSAIDs, ACEi or ARBs becomes unwell (e.g. vomiting, diarrhoea, fevers, sweats or shaking). The rules are based on an *association* in studies between the development of AKI during an acute illness and receiving a prescription for these drugs. The challenge in interpreting such data is potential confounding by the very reason patients are taking these drugs e.g. heart failure, which itself may be associated with a deterioration in renal function at a time of illness. What is unknown from properly conducted studies is whether withholding ACEi/ARB at the time of AKI is beneficial or harmful. This is highlighted by 'Think Kidneys' in a position statement on their website (https://www.thinkkidneys.nhs.uk/aki/wp-content/uploads/sites/2/2015/07/Think-Kidneys-Sick-Day-Guidance-v8-131115.pdf). In particular they note that:

(i) The evidence that provision of sick day guidance reduces net harm is very weak

(ii) There are potential harms associated with widespread provision of sick day rules or guidance, particularly when the patients have not been clinically

assessed. Examples include, decompensated heart failure when ACEI/ARBs and diuretics are discontinued, reduced adherence to drug treatment incorrectly described as 'nephrotoxic', patients considering that the potential harm outweighs the potential benefit and deciding to stop taking the drug, patients not re-starting their drug treatment on recovery or the drugs not being titrated back to the previous evidence-based levels.

The statement also notes the theoretical possibility that ACEI and ARB treatment might reduce the severity or duration of AKI, at least in a subset of patients.

The Board of the BSH believes that consultation with **all** stakeholders including local heart failure services is fundamental when local AKI or sick day guidance/pathways are being produced. If AKI is highlighted in a patient with heart failure the priority is to ensure that the patient receives a careful clinical assessment and then before a decision is made as to whether treatment change is warranted. It is important to remember that patients presenting with decompensated heart failure often suffer deterioration in renal function as a consequence of the fluid overload. Diuresis is the mainstay of treatment in these situations and withholding drugs may well do more harm – tailoring care to the individual is key. Some deterioration in renal function when commencing ACEi, ARB or mineralocorticoid receptor antagonist is common in patients with heart failure but in the vast majority of cases does not require cessation of the drug (see ESC Guidelines).