

## COMPLICATIONS

The complications of hypertension can be considered either hypertensive or atherosclerotic. Although the extent of damage often correlates with the level of blood pressure, it is not always the case. Blood pressure and organ impairment should be evaluated separately. The various complications are as follows:

### 1. Hypertensive Heart Disease

- Hypertension has the following effects on the heart: left ventricular hypertrophy, increased risk of coronary artery disease, arrhythmias, congestive cardiac failure and sudden death.<sup>77</sup>
- Most episodes of left ventricular failure in hypertensive patients are associated with reduced ejection fraction.
- Treatment of hypertension can reverse ventricular hypertrophy with no impairment of systolic function and improved diastolic function.<sup>78,79</sup> However, the impact of reduction of LVH on reduction of morbidity and mortality is still debated.

### 2. Cerebrovascular Disease

- Hypertension is the most important modifiable risk factor for all types of atherothrombotic stroke<sup>80</sup> and intracerebral haemorrhage due to rupture of Charcot-Bouchard aneurysms.
- The relation between the incidence of stroke and blood pressure is continuous.<sup>81,82</sup> A 5-6 mm Hg reduction in diastolic blood pressure reduces the risk of stroke by 40%.<sup>83</sup>
- The SHEP (Systolic Hypertension Elderly Program) study showed substantial benefit following control of systolic blood pressure in the elderly.<sup>38</sup>

### 3. Kidney

- About 20-25% of renal failure is attributed to uncontrolled hypertension.<sup>84</sup>
- Development of renal damage is heralded by microalbuminuria, which progresses to overt proteinuria and may further progress to end stage renal disease.<sup>85</sup>
- Reduction of proteinuria can be achieved by effective blood pressure control specially with use of ACE inhibitors and ARBs.<sup>86,87</sup>

### 4. Retina

- Hypertensive retinopathy is a condition characterized by a spectrum of retinal vascular signs in people with elevated blood pressure.
- The classification of Keith, Wagener and Barker has been widely used. Grade I retinopathy is characterized by copper wire appearance; Grade II by arteriovenous nicking; Grade III by the presence of haemorrhages and exudates; and Grade IV by papilloedema.
- Grade III and IV retinopathy is seen in long standing uncontrolled hypertension. These changes may regress with effective control of blood pressure.
- Several reviews of hypertensive retinopathy since 1996 have questioned the usefulness of the classification system by Keith, *et al* and its relevance to current clinical practice. Recent studies show that some of the retinal signs (e.g., hemorrhages, microaneurysms and cotton-wool spots) predict stroke and death from stroke independently of elevated blood pressure and other risk factors.<sup>88</sup>

### 5. Large Vessel Disease

- Hypertension is a risk factor for development of intermittent claudication. It also increases the risk of abdominal aortic aneurysms and aortic dissection. Eighty percent of patients with aortic dissection have hypertension.<sup>89</sup>