

# Stroke – a preventable catastrophe

**Eoin O'Brien looks at how Ireland could significantly reduce stroke incidence by achieving optimal blood pressure control in patients**



**DEATHS FROM HEART ATTACK** have been falling steadily over the past 20 years but the disability from stroke is unchanged. The great majority of patients who recover from a heart attack return to work; more often than not the stroke sufferer leaves behind an empty desk.

There has been a disproportionate allocation of resources to the acute treatment of stroke as compared to heart attack, and the deplorable deficit of facilities to manage acute stroke is highlighted in the recently completed Irish Heart Foundation Council on Stroke/Health Service Executive National Stroke Strategy.

This strategy should leave the Government with no option other than to urgently address the demands for adequate treatment and ongoing rehabilitation for this long-neglected illness.<sup>1</sup> The Irish Heart Foundation report deals with the management of acute stroke, whereas in this review my emphasis will be on the prevention of stroke – each approach being complementary.

Stroke can be a devastating disease, leading to death or severe disability that places a huge immediate and ongoing financial burden on the healthcare services. But the consequences of stroke go far beyond the purely fiscal imperatives for the State. The profound personal consequences for sufferers, their families and carers and the far-reaching social consequences resulting from permanent disability of individuals often struck down in their prime, are of greater impact for society as a whole.

Approximately 10,000 cases with acute strokes are admitted to hospital annually in the Republic of Ireland, and of these, 30% die within one year, which is more than those who die from cancer of the lung, bowel and breast combined. For those who survive – some 30,000 people – only half make a complete recovery, with 48% of these remaining partially paralysed, 22% unable to walk, 33% having difficulties understanding, and 32% suffering from depression – all serious disabilities which need support in order for the patients to cope with the activities of daily life.<sup>2-4</sup>

#### **Situation to worsen**

Projections indicate that the population aged 65 years or

older will grow by around 107,771 persons in the period 1996-2011, to represent 14.1% of the general population. The proportion of persons over 80 years will increase to 24.9%.

Put another way, in 1926 an Irish male infant was expected to live only 57 years, with Irish female infants faring slightly better by surviving to 58 years. Contrast this with similar estimates in 1996 when Irish men at birth can expect to live until 73 years and Irish women until 78.5 years.<sup>5</sup>

The inevitable consequence of increased longevity in Ireland is that despite remarkable therapeutic advances, the burden of heart attack and stroke must increase and, ironically, the very medical advances that have resulted in a substantial reduction in coronary heart disease mortality will further accelerate this burden by allowing progression to stages of the illness not previously commonplace, such as heart failure.

#### **Effective control of hypertension**

Most strokes are preventable and though the causes of stroke (and heart attack) are multifactorial, ranging from an individual's genetic make-up to lifestyle and environmental factors, if one examines the greatest benefit accruing to Irish society by the reversal of a single risk factor, it would have to be the effective control of elevated blood pressure, or hypertension.

Based on the evidence available it can be safely stated that if patients with hypertension in Ireland had their blood pressures reduced to optimal levels, stroke could be reduced by at least 50% and probably appreciably more, and heart attack and other cardiovascular manifestations of hypertension would also be reduced.<sup>6,7</sup>

The caveat to this assumption is that blood pressure must be reduced to optimal levels; merely prescribing antihypertensive drugs will not suffice. Let us examine, therefore, how good blood pressure control is in this country.

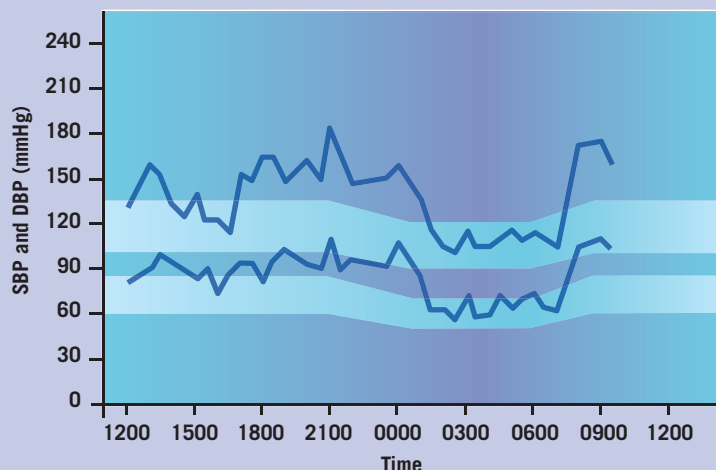
#### **BP control – the dreaded rule of halves**

In Ireland, as in western societies, hypertension affects some 30% of the adult population and in keeping with other

**Conventional clinic measurement and example of ABPM**

Example of conventional clinic measurement:

- Artificial circumstance away from usual environment
- Possible white coat response
- Subject to observer prejudice
- Subject to terminal digit preference
- Classification of BP not possible
- No 24-hour BP profile
- No nocturnal BP



Example of ABPM showing a mildly hypertensive patient with nocturnal dipping and white coat effect: "On basis of recorded data and available literature, ambulatory blood pressure suggests mild daytime systolic and diastolic hypertension (147/93mmHg) and normal night-time systolic and diastolic blood pressure (111/66mmHg) with white coat effect (158/90mmHg)".

*Plot and report generated by dabl ABPM - © dabl 2006 (www.dabl.ie)*

societies, BP rises with age, with 30% of the population aged 30 and 70% of those aged 70 having high blood pressure. With increasing longevity worldwide, estimates for high BP will approach one billion people. Approximately 12.8% of all deaths (7.1 million) and 4.4% of all disability life-years lost (64.3 million) in the year 2000 were due to poor control of BP levels.<sup>8</sup>

However, despite knowing for at least two decades the importance of BP control in preventing stroke, and despite having more than enough drugs available to us to effectively treat hypertension, the 'rule of halves' is operative in most European countries:<sup>9,10</sup>

- Only half the people in Irish society with hypertension are aware that their BP is raised
- Of those identified as having high BP, only half are on BP lowering drugs; and of those receiving treatment only half are well controlled.

To which might be added, if those with undiagnosed hypertension and those with inadequately treated hypertension all had adequate BP control instituted, stroke could be reduced by over 50% (ie. 5,000 fewer strokes annually).

This unhappy state of affairs in Europe has prompted the European Society of Hypertension to establish firstly a register of specialists in hypertension, and secondly to lay down the criteria for centres of excellence in hypertension management in recognition of the fact that hypertension is a more complex disease than was hitherto realised.<sup>11</sup>

These considerations lead to the inevitable conclusion that the most worthwhile initiative to reverse the growing epidemic of stroke, would be to achieve nationwide control of BP in subjects with hypertension.

#### How can stroke be prevented? BP control with ABPM

One sometimes has to ponder what it takes to make a technique so indispensable to practice that it must, needs

be, become the rule rather than the exception. And yet nothing is new under the sun; it seems to me that ambulatory BP measurement (ABPM) is in much the same historical position at the start of the twenty-first century as conventional measurement with the mercury sphygmomanometer and stethoscope was at the end of the nineteenth.

One sceptic, while acknowledging that 'the middle-aged and successful physician may slowly and imperceptibly lose the exquisite sensitiveness of his finger tips through repeated attacks of gouty neuritis', went on to express his sincere doubts that the sphygmomanometer would ever be welcomed by 'the overworked and underpaid GP, already loaded with thermometer, stethoscope, etc. etc.'<sup>12</sup>

ABPM is not exactly new to medicine; in fact it has been with us in one form or another for nearly half a century. I first used ABPM in 1979 when we anticipated that 'development of a cheap and accurate means of ambulatory recording would have a considerable impact on the diagnosis of borderline hypertension and the assessment of the efficacy of treatment.' This forecast has been slow to materialise but ABPM is now regarded as indispensable to a good clinical practice.<sup>13</sup>

#### Superiority of ABPM over conventional BP measurement

It is a salutary thought that if (as conservative estimates show) white coat hypertension is present in 20% of the population when BP is measured conventionally in primary care, and if masked hypertension is present in 10% of patients whose BP is measured in similar circumstances, it follows that hypertension is being misdiagnosed in as many as a third of all patients attending for routine BP measurements.<sup>13</sup>

This degree of inaccuracy quite rightly would not be tolerated in any laboratory test but we accept it in clinical practice – why?



The advantages for ABPM are many and here are some reasons:

- First and foremost, the technique simply gives more measurements than conventional measurement, and the real BP is reflected more accurately by repeated measurements
- ABPM provides a profile of BP away from the medical environment, thereby allowing identification of individuals with a white coat response, or masked hypertension, who are in need of careful management
- ABPM shows BP behaviour over a 24-hour period rather than giving a snapshot of BP performed with an inaccurate technique under artificial circumstances, so that the efficacy of antihypertensive medication over a 24-hour period becomes apparent rather than relying on one or a few conventional measurements confined to a short period of the diurnal cycle
- ABPM can identify patients with abnormal patterns of nocturnal BP – dippers and non-dippers, extreme and reverse dippers, sleep apnoea hypertension and the morning surge – all of which are associated with high risk
- The technique can demonstrate a number of patterns of BP behaviour relevant to clinical management – isolated systolic and isolated diastolic hypertension, post-prandial hypotension, autonomic failure, etc.

Finally, and importantly, evidence is now available from longitudinal studies that ABPM is a much stronger predictor of cardiovascular morbidity and mortality than conventional measurement – in other words, ABPM identifies patients with hypertension (and subjects whose BP is normal) and who are at risk from future cardiovascular events. Moreover, the evidence is growing that nocturnal BP measured by ABPM may be the most sensitive predictor of cardiovascular outcome, from which it follows that the measurement of night-time BP should be an important part of clinical practice.<sup>13</sup>

#### Feasibility of an ABPM network to control BP

Ireland was the first European country to show that ABPM using the dabl interpretive reporting and analysis software programme could be used effectively in primary care to achieve better BP control in patients with hypertension.

The RAMBLER study showed that ABPM allowed patients with adequate BP control to be identified and in some cases prevented from unnecessarily commencing on antihypertensive medication, and that that BP control was improved in those managed with ABPM compared with conventional measurement. This led the authors to conclude that 'ABPM appears to have a significant impact on decision-making of general practitioners and on the medical management of patients with hypertension in the community.'<sup>14</sup>


The RHASP (Reduction of Heart Attack and Stroke through Prevention) study demonstrated the feasibility of linking primary care locations online to a central system and database.<sup>15</sup> Recently, the Spanish Society of Hypertension has developed a nationwide project based on electronic transfer of data to promote the use of ABPM in primary care settings. With 1,126 physicians contributing over 20,000 ABPM records, the study has demonstrated there was a wide discrepancy between clinic and ambulatory BPs, particularly in patients with severe hypertension at the office, that high-risk patients had the most unfavourable ABPM levels when

compared with low-to-moderate risk patients in spite of receiving much more antihypertensive treatment, and that high-risk hypertensive patients showed a high prevalence of a nocturnal non-dipper pattern. These advantages of ABPM are leading to extension of the programme nationwide in Spain.<sup>16</sup>

#### Conclusions

There are a number of messages from this review. First, we have the means to reduce the rule of halves through centralised electronic use of ABPM, which if applied nationally would result in the achievement of optimal BP control in hypertensive patients and a halving of some 10,000 strokes that occur annually. To do so, however, we need to provide primary care with the necessary software facility to ensure that optimal BP control is being achieved.

If ABPM is to become an integral part of good clinical practice it is up to healthcare providers to reimburse doctors adequately for the procedure given the assurance of considerable cost savings. Practising physicians must agitate for a technique that will provide them with the means of diagnosing their hypertensive patients more accurately, of guiding drug prescribing more efficiently, and of predicting risk and outcome in individual patients.

Finally, it might not be a bad idea for patients to take a look at ABPM and to ask why the investigation is being denied to them so often. 

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