Sustained antihypertensive activity of telmisartan compared with valsartan
Yves Lacourcière⁷, Jean-Marie Krzesinski⁶, William B White⁵, Giora Davidai⁴ and Helmut Schumacher³

Background Early morning blood pressure (BP) surge and 24 h mean BP are linked to target-organ damage and cardiovascular events. Antihypertensive agents should sustain BP control, particularly in the last 6 h of the dosing interval or if dosing is missed. The efficacies of the long half-life telmisartan compared with shorter half-life valsartan in the last 6 h of the dosing interval following active treatment and during 24 h after a missed dose were compared.

Methods In two identically designed multinational, randomized, double-blind, forced-dosification studies, hypertensive patients (seated diastolic blood pressure (DBP), 95–109 mm Hg, 24 h mean ambulatory DBP, ≥ 85 mm Hg) received once-daily telmisartan (40–80 mg) or valsartan (80–160 mg) for a total of 8 weeks; up titration occurred after 2 weeks’ low-dose treatment. After 4 weeks’ high-dose treatment, patients were given either 1 day’s double-blind active therapy or placebo (that is, missed dose). Following a further 2 weeks’ active treatment, a cross-over was performed: patients who had previously received 1 day’s placebo received active therapy and vice versa. At baseline and after the two active or missed doses, 24 h ambulatory BP monitoring was performed. Data from the studies were pooled, as prospectively planned and analyzed using the intent-to-treat population.

Results After active therapy, last 6 h mean DBP was reduced by 7.6 ± 7.9 mm Hg with telmisartan (n=447) compared with 5.8 ± 7.8 mm Hg with valsartan (n=430) (P=0.0044). Last 6 h mean systolic blood pressure (SBP) was reduced by 11.1 mm Hg with telmisartan compared with 9.1 mm Hg with valsartan (P=0.0066). After a missed dose, 24 h mean DBP was reduced by 7.2 ± 6.5 mm Hg with telmisartan (n=437) compared with 5.5 ± 6.2 mm Hg with valsartan (n=431) (P=0.0004). The reduction in 24 h mean SBP after a missed dose was 10.7 mm Hg with telmisartan and 8.7 mm Hg with valsartan (P=0.0024). Absence of treatment-by-study interaction indicated that pooling of studies was appropriate. All 24 hourly mean reductions in DBP and SBP were greater for telmisartan than valsartan. Both treatments were well tolerated.

Conclusions Due to its longer half-life, telmisartan offers more sustained BP control, especially at the end of the dosing period and provides sustained efficacy in poorly compliant patients in the event of a missed dose with a statistical superiority compared with valsartan. Blood Press Monit 9:203–210 © 2004 Lippincott Williams & Wilkins.

Keywords: circadian blood pressure rhythm, ambulatory blood pressure, hypertension, telmisartan, valsartan, missed dose, angiotensin II receptor blockers

Introduction Patients with hypertension are at greater risk of cardiovascular events than people with normal blood pressure (BP) [1]. Epidemiological studies have shown that the rate of onset of cardiovascular events, such as acute myocardial infarction, ischemic stroke and sudden death, occurs in a circadian (24 h) pattern, which increases sharply in the early morning period within 4–6 h of awakening [2–5]. BP also follows a highly reproducible circadian rhythm, with generally low values during sleep and higher values during periods of activity [6,7]. Most notably, there is a steep early morning rise in BP, which coincides with the peak incidence of cardiovascular events [1,4].

The synchrony between the circadian variation of BP and the onset of cardiovascular events has prompted investigation into longer-acting antihypertensive agents that have persistent activity throughout the dosing interval, particularly during the risky early morning hours. Concerns about the lack of compliance with antihypertensive therapy have also highlighted the need for agents that can
provide sustained BP control even if a dose is accidentally missed.

The angiotensin II receptor blockers (ARBs) are a class of well-tolerated antihypertensive agents, which block the pathophysiological actions of angiotensin II that result in high BP at the AT1 receptor level [8]. The pharmacokinetic properties of ARBs vary and this may impact on clinical activity. Telmisartan achieves peak plasma concentrations about 1 h after oral administration and has an elimination half-life of about 24 h [9]. In comparison with other ARBs, telmisartan has the longest plasma half-life [9,10]. Previous studies have shown that telmisartan given once daily maintains substantial BP control throughout the dosing interval [11–14].

This paper reports the pooled results of two identical studies [15,16] comparing the effects of telmisartan (80 mg), which has a long half-life, with those of valsartan (160 mg), an ARB with an intermediate half-life of 7 h [17,18], on BP control during the last 6 h of the dosing interval and during the 24 h after missing a dose in adults with mild-to-moderate hypertension.

Methods
Two identically designed multicenter, 8-week, double-blind, double-dummy, randomized, parallel-group, forced-titration studies were conducted, one in 34 centers in the USA and Canada and the other in 45 centers in Europe and South Africa. Both studies were prospectively designed with the intention of pooling the resulting data for combined analysis. The studies were performed in accordance with Good clinical practice guidelines and approved by appropriate ethical committees for the participating sites.

Previous studies of telmisartan suggest that the SD of the change from baseline in 24 h mean diastolic blood pressure (DBP) measured by ambulatory blood pressure monitoring (ABPM) may be as much as 8 mm Hg. Using this estimate for the SD, a sample size of 150 patients per study per treatment arm would have 90% power at the 5% (two-sided) level of significance to detect a 3.0 mm Hg difference between treatments in the reduction from baseline in the 24 h mean value. In addition, the assumption was made that 15% of randomized patients would prematurely discontinue each study without valid ABPM measurements at the end of treatment, thus each study would require a total of 360 patients to be randomized. In ABPM studies, as many as 50% of patients do not meet the ABPM inclusion criteria. Thus, approximately 720 patients per study were enrolled into the single-blind placebo washout period to attain the 150 patients per treatment regimen with baseline and both final successful ABPM measurements.

The study design is outlined in Figure 1. The screening period lasted 1–7 days. Patients of either sex over 18 years of age were eligible. Night-shift workers (that is, those who routinely slept during the day and whose shift hours included midnight to 04:00 h), whose sleep/wake cycles were likely to interfere with the usual day/night circadian pattern of BP were not eligible for inclusion. Other exclusion criteria included a history of coronary disease, stroke, congestive heart failure, known or suspected secondary hypertension, poorly controlled diabetes mellitus or chronic renal failure.

All patients gave informed consent before entering a study. After the 2–4-week placebo run-in period to eliminate any potential effects of previous antihypertensive therapy, patients with mild-to-moderate systemic hypertension defined as average seated diastolic manual cuff BP of ≥ 95–109 mm Hg measured in the morning at approximately 08:30 h were eligible for inclusion. To ensure that only patients with sustained ≥ hypertension were included in the study, 24 h mean ambulatory DBP had to be ≥ 85 mm Hg at baseline at the end of the placebo run-in period. There were no restrictions on body weight or body mass index.

After the withdrawal of any previous antihypertensive therapy and the subsequent completion of the 2–4-week single-blind placebo run-in period, eligible patients were randomized to 8 weeks’ double-blind once-daily active treatment with either telmisartan or valsartan. The dosing of medication was timed to occur at about the same time each day and as close to 09:00 h as possible (± 1 h). For the first 2 weeks, patients received once-daily 40 mg telmisartan or once-daily 80 mg valsartan. The once-daily dose was increased to 80 mg telmisartan or 160 mg valsartan, respectively, for the subsequent 6 weeks. After 4 weeks of treatment with the higher dose, 1 day of double-blind active therapy or a placebo was given to patients in each treatment arm; receipt of placebo thus mimicked a missed dose. After 2 more weeks of active treatment, patients previously given 1 day of placebo received 1 day of active therapy and those previously in receipt of 1 day of active treatment were administered 1 day of placebo. ABPM over a 24 h period was performed at baseline and on both of the active/missed dose days. Efficacies of the two drugs were compared by determining the last 6 h mean ambulatory BP after the active dose in relation to baseline and the 24 h mean ambulatory BP after the missed dose in relation to baseline.

Seated office or clinic BP was measured in triplicate at all visits by mercury column sphygmomanometry. Heart rate was measured between the second and third readings. Ambulatory BP was measured using a SpaceLabs 90207 monitor (SpaceLabs, Richmond, Washington, USA),
which was applied to the patient between 07:30 h and 10:00 h on the day of monitoring. The ABPM device was started as soon as the patient received their dose of medication. For each patient, the three ABPM monitoring sessions (baseline, active dose and missed dose) were timed to begin at around the same time and on similar days of the week, so as to minimize intersession differences in BP. During each ABPM session, BP was measured every 20 min during the day and night and hourly means relative to the dosing time were calculated. The data from an ABPM session were considered valid and acceptable if (1) a minimum of 18 hourly means were recorded within 24 h of dosing and (2) no more than three consecutive hourly means were missing during the 24 h period. If valid ABPM data were not obtained at the first baseline evaluation, the patient was allowed to repeat the ABPM procedure. If valid data were not obtained at other ABPM sessions, the patient was excluded from the relevant primary endpoint efficacy analysis.

Compliance with study medication was monitored at each visit by counting the number of tablets and was expressed as a percentage of the total number of tablets that should have been taken.

The safety evaluation included pulse rate monitoring and a record of the incidence and severity of adverse events. All reported adverse events were categorized by body system and preferred term using the Medical dictionary for regulatory activities (MedDRA) [19]. The incidence of adverse events in each treatment group was tabulated by severity and relationship to study drug (as determined by site investigators). All patients who received at least one dose of study medication were included in the safety evaluation.

The comparability of patients in the two treatment groups was determined using descriptive statistics of demographic data and baseline BP values.

Primary efficacy endpoints were the changes from baseline in DBP after 6–8 weeks’ treatment (1) during the last 6 h of the dosing interval following receipt of an active dose of medication and (2) during the 24 h after a missed dose. Statistical analysis was performed on an intent-to-treat basis. Treatment effects were evaluated using analysis of covariance (ANCOVA), which included treatment, study and treatment-by-study interaction as main effects and which used baseline measurements as
the covariate. Treatment comparisons were based on least-squares means calculated via a SAS general linear model procedure (SAS Version 8, Cary, North Carolina, USA) [20]. The Bonferroni–Holm procedure was applied to adjust for multiple testing.

Secondary efficacy analyses included the change from baseline in systolic blood pressure (SBP) during the last 6 h of the dosing interval following an active dose of medication and during the 24 h interval following a missed dose of medication, as well as DBP and SBP during other predefined periods of the dosing interval: day time (06:00–21:59 h), night time (22:00–05:59 h) and morning (06:00–11:59 h).

The study also determined the proportion of patients who responded to treatment. Response was assessed as the percentage of patients who achieved 24 h mean DBP < 80 mm Hg or a reduction from baseline ≥ 10 mm Hg.

Results
A total of 930 patients, 468 patients in the telmisartan treatment group and 462 in the valsartan treatment group, were enrolled and included in the safety analysis (Table 1). The mean ± SD age of patients in the two studies was 53.9 ± 9.8 years. Patients were predominantly men (69.0%) and white (88.6%). The mean duration of hypertension was 7.8 years and > 80% of patients had had hypertension for > 1 year. Baseline ABPM and clinic BP measurements and pulse rates were similar and comparable between treatment groups. The number of patients in each treatment group who had been taking one or more antihypertensive medications prior to enrolment was similar for both treatment groups: telmisartan, 65% and valsartan, 64%.

Compliance with medication in terms of percentage of prescribed therapy taken was high (> 99%) and similar in both treatment groups.

Last 6 h mean ambulatory blood pressure after an active dose
The mean ambulatory DBP during the last 6 h of the dosing interval following an active dose of medication was reduced by 7.6 ± 7.9 mm Hg in the telmisartan group (n = 447), from 88.1 ± 8.1 mm Hg at baseline to 80.5 > ± 9.4 mm Hg in the last 6 h of dosing. In the valsartan group (n = 430), the last 6 h mean ambulatory DBP fell by 5.8 ± 7.8 mm Hg, from 87.1 ± 7.5 mm Hg at baseline to 81.3 ± 9.4 mm Hg. The adjusted difference in DBP mean reduction (adjusted for baseline, study and treatment-by-study interaction) between the two treatment groups was statistically more in favor of telmisartan (−7.5 mm Hg compared with −6.0 mm Hg, P = 0.0044).

Changes from baseline in mean hourly DBP values during the 24 h dosing interval after an active dose of either telmisartan or valsartan are shown in Figure 2. DBP was reduced by an average of 5–10 mm Hg from baseline in both treatment groups over the course of the 24 h period. During the last 10 h of the dosing interval, hourly mean reductions in DBP were consistently greater in the telmisartan group than in the valsartan group.

Mean hourly SBP reductions during the last 6 h of the dosing interval followed the same pattern as those for DBP, with significantly greater mean reductions in the telmisartan group (–9.1 mm Hg) than in the valsartan group (–8.5 mm Hg).

Table 1 Patient demographics and baseline characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Telmisartan (n = 468)</th>
<th>Valsartan (n = 462)</th>
<th>Total (n = 930)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td>53.7 (10.0)</td>
<td>54.1 (9.7)</td>
<td>53.9 (9.8)</td>
</tr>
<tr>
<td><strong>Sex (%)</strong></td>
<td>Men 315 (67.3)</td>
<td>327 (70.8)</td>
<td>642 (69.0)</td>
</tr>
<tr>
<td><strong>Race (%)</strong></td>
<td>Men 409 (87.4)</td>
<td>415 (89.8)</td>
<td>824 (88.6)</td>
</tr>
<tr>
<td><strong>Body mass index (kg/m2)</strong></td>
<td>Men 28.8 (4.7)</td>
<td>29.1 (4.7)</td>
<td>29.0 (4.7)</td>
</tr>
<tr>
<td><strong>Hypertension duration</strong></td>
<td>Men 15–52</td>
<td>20–50</td>
<td>15–52</td>
</tr>
<tr>
<td><strong>24 h ABPM mean</strong></td>
<td>Diastolic (mm Hg (SD))</td>
<td>93.4 (6.2)</td>
<td>92.9 (5.9)</td>
</tr>
<tr>
<td><strong>Systolic (mm Hg (SD))</strong></td>
<td>149.1 (11.8)</td>
<td>149.1 (12.0)</td>
<td>149.1 (11.9)</td>
</tr>
<tr>
<td><strong>Pulse rate (beats/min (SD))</strong></td>
<td>76.8 (9.4)</td>
<td>76.1 (10.3)</td>
<td>76.5 (9.9)</td>
</tr>
</tbody>
</table>

Mean duration of hypertension was 7.8 years and > 80% of patients had had hypertension for > 1 year. Baseline ABPM and clinic BP measurements and pulse rates were similar and comparable between treatment groups. The number of patients in each treatment group who had been taking one or more antihypertensive medications prior to enrolment was similar for both treatment groups: telmisartan, 65% and valsartan, 64%.

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Twenty-four-hour mean ambulatory blood pressure after a missed dose
In the telmisartan group (n = 447), the 24 h mean ambulatory DBP was 86.2 ± 7.6 mm Hg following a missed dose compared with a baseline value of 93.4 ± 6.2 mm Hg; thus there was a reduction of 7.2 ± 6.5 mm Hg compared with baseline. In the valsartan group (n = 431), 24 h mean ambulatory DBP after a missed dose was 87.2 ± 7.4 mm Hg as opposed to 92.8 mm Hg at baseline; thus there was a reduction of 5.5 ± 6.2 mm Hg compared with baseline. The difference in adjusted 24 h mean ambulatory DBP reduction between treatments was statistically significant in favor of telmisartan (–7.1 mm Hg compared with –5.6 mm Hg, P = 0.0066).

The changes from baseline in mean hourly ambulatory DBP during the 24 h period following a missed dose are

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shown in Figure 3. On average, ambulatory DBP after a missed dose was reduced by approximately 4–9 mm Hg in both treatment groups. The ambulatory DBP throughout this 24 h period was lower in the telmisartan group than in the valsartan group at all time points. This difference was maintained until the last 6 h of the missed dose period (that is, 48 h after the last dose of medication), during which interval ambulatory adjusted DBP reduction was significantly greater in the telmisartan group (−6.7 mm Hg) than in the valsartan group (−4.6 mm Hg, \( P < 0.0001 \)).

In addition to the reduced DBP, significantly more patients achieved a DBP response (24 h DBP mean < 80 mm Hg or a reduction from baseline of at least 10 mm Hg) after a missed dose in the telmisartan group (27.0%) than in the valsartan group (20.9%, \( P = 0.0387 \)).
Changes in seated clinic cuff blood pressure following administration of an active dose, telmisartan ($n = 460$) reduced seated clinic SBP by 14.0 mm Hg and DBP by 9.0 mm Hg, whereas valsartan ($n = 450$) reduced SBP and DBP by 12.1 and 8.2 mm Hg, respectively. In the case of SBP, telmisartan produced a statistically superior reduction ($P = 0.0281$) compared with valsartan. Although the reduction in DBP was numerically in favor of telmisartan, the effect did not achieve statistical significance ($P = 0.1137$). After a missed dose, telmisartan ($n = 445$) reduced seated clinic SBP by 11.7 mm Hg and DBP by 7.5 mm Hg, whereas valsartan ($n = 432$) reduced SBP and DBP by 10.0 and 6.8 mm Hg.

Table 2  Ambulatory systolic blood pressure reductions adjusted for baseline, study and treatment-by-study interaction at intervals during 24 h after a missed dose

<table>
<thead>
<tr>
<th></th>
<th>Telmisartan</th>
<th>Valsartan</th>
<th>$P$-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean systolic blood pressure (mm Hg ± SE)</td>
<td>(80 mg) (n=437)</td>
<td>(160 mg) (n=431)</td>
<td></td>
</tr>
<tr>
<td>24 h</td>
<td>$-10.7 ± 0.44$</td>
<td>$-8.7 ± 0.45$</td>
<td>0.0024</td>
</tr>
<tr>
<td>Last 6 h of dosing interval</td>
<td>$-9.8 ± 0.49$</td>
<td>$-7.1 ± 0.50$</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Daytime (06:00–21:59 h)</td>
<td>$-10.9 ± 0.48$</td>
<td>$-9.4 ± 0.48$</td>
<td>0.0286</td>
</tr>
<tr>
<td>Night-time (22:00–05:59 h)</td>
<td>$-10.1 ± 0.49$</td>
<td>$-7.5 ± 0.49$</td>
<td>0.0002</td>
</tr>
<tr>
<td>Morning (06:00–11:59 h)</td>
<td>$-11.2 ± 0.50$</td>
<td>$-9.1 ± 0.50$</td>
<td>0.0040</td>
</tr>
</tbody>
</table>

SE, standard error of the mean.

*P-value of the difference between telmisartan and valsartan.

Changes in seated clinic cuff blood pressure
Following administration of an active dose, telmisartan ($n = 460$) reduced seated clinic SBP by 14.0 mm Hg and DBP by 9.0 mm Hg, whereas valsartan ($n = 450$) reduced SBP and DBP by 12.1 and 8.2 mm Hg, respectively. In the case of SBP, telmisartan produced a statistically superior reduction ($P = 0.0281$) compared with valsartan. Although the reduction in DBP was numerically in favor of telmisartan, the effect did not achieve statistical significance ($P = 0.1137$). After a missed dose, telmisartan ($n = 445$) reduced seated clinic SBP by 11.7 mm Hg and DBP by 7.5 mm Hg, whereas valsartan ($n = 432$) reduced SBP and DBP by 10.0 and 6.8 mm Hg,
respectively. Again, although the reductions were numerically in favor of telmisartan, the effects did not achieve statistical significance (SBP, \( P = 0.0502 \); DBP, \( P = 0.1795 \)).

For all efficacy analyses, there was no study effect and no treatment-by-study interaction, thus indicating that the treatment difference was consistent across the two studies and that pooling of study data for analysis was appropriate.

**Safety evaluation**

Pooled analysis of safety data from the two studies showed that both telmisartan and valsartan were well tolerated with the majority of adverse events being mild or moderate in intensity. The most commonly reported adverse events with an incidence > 1% were headache, dizziness, nasopharyngitis, fatigue, upper respiratory tract infection and nausea. The number of patients with any adverse event during the 8-week double-blind treatment period with telmisartan was 63 out of 468 (13.5%) at the 40 mg dose and 101 out of 464 (21.8%) at the 80 mg dose and with valsartan was 60 out of 462 (13.0%) at the 80 mg dose and 86 out of 452 (19.0%) at the 160 mg dose. Of these, 10 (2.1%) patients on 40 mg telmisartan, 21 (4.5%) patients on 80 mg telmisartan, 13 (2.8%) patients on 80 mg valsartan and 16 (3.5%) patients on 160 mg valsartan had an adverse event that was considered to be drug related, the most common of which was headache (80 mg telmisartan, 1.3%). No other drug-related adverse event occurred with a frequency of > 1% in either treatment group.

There were no deaths reported during the study. In all, nine randomized patients had a total of 11 serious adverse events during the study. Five patients had a serious adverse event during the double-blind treatment phase (two with telmisartan (compression fracture and myocardial infarction) and three with valsartan (skin ulcer, coronary artery disease and viral encephalitis)) and five patients had a serious adverse event during the 2-week follow-up phase (two in the telmisartan group and three in the valsartan group). None of the serious adverse events were considered to be related to study medication.

No clinically significant change in mean pulse rate was observed in any patient during the study.

**Discussion**

Once-daily treatment with 80 mg telmisartan lowered SBP and DBP throughout the 24 h dosing period and, in particular, during the last 6 h of the dosing interval to a significantly greater degree than once-daily 160 mg valsartan in patients with mild-to-moderate hypertension documented by ABPM. These results support those of previous ABPM studies, in which telmisartan produced significantly greater reductions in mean ambulatory BP in the last 4–6 h of the dosing interval than valsartan, losartan or amlodipine [11–14]. In the earlier comparison of telmisartan and valsartan by Littlejohn and colleagues [11], 80 mg telmisartan was associated with a significantly greater mean reduction from baseline in ambulatory DBP in the last 6 h than 80 mg valsartan (−7.5 mm Hg compared with −5.2 mm Hg, respectively, \( P < 0.01 \)). However, the study may be open to criticism because the 80 mg dose of valsartan may have been suboptimal. The present study, which used the 160 mg valsartan dose, has demonstrated that the additional reduction in BP afforded by 80 mg telmisartan is valid, reproducible and significantly greater than that provided by 160 mg valsartan.

In the present studies, medication was administered in the morning such that the last 6 h of the dosing interval coincided with the early morning hours (between approximately 03:00 h and 09:00 h). During this time there is a characteristic surge in BP, which starts at the time of arousal and increased physical activity, with steep increases in SBP of about 3 mm Hg/h and in DBP of about 2 mm Hg/h for a period of 4–6 h [21]. During this same time period there is also a steep rise in the incidence of acute cardiovascular and cerebrovascular events. For example, epidemiological studies have shown that the incidences of acute myocardial infarction and ischemic stroke are highest during the first 3–4 h after awakening [2,3]. Early morning changes in neurohormonal factors, such as epinephrine and norepinephrine and in hematological parameters, such as increased platelet aggregation are believed to contribute to an increased risk of cardiovascular and cerebrovascular events [22,23].

Telmisartan provides sustained control of BP at this vulnerable time at the end of the dosing interval. This may translate into added protection against morbid or fatal events.

The unique design of the studies reported in this paper allowed an assessment of the effects of telmisartan and valsartan after a missed dose while retaining double-blind conditions. The cross-over design of the study meant that during the steady-state period of active treatment, each patient had one missed-dose day and one active-medication-dose day; thus each patient acted as their own control.

Following a missed dose, 80 mg telmisartan provided significantly greater BP reduction than 160 mg valsartan for up to 48 h after an active dose. The distinction between telmisartan and valsartan became particularly pronounced during the last 6–10 h of the 24 h period after a missed dose. This observation is of relevance for patient compliance. Current estimates suggest that only 50–60%
of hypertensive patients adhere strictly to their prescribed dosing regimen, with the remainder either variably or poorly compliant [24]. It is not surprising then that nearly 75% of hypertensive patients have inadequate BP control (that is, > 90/140 mm Hg DBP/SBP) [25] and are thus exposed to an increased risk of BP-related cardiovascular events and premature death [26,27]. The findings from this study demonstrate that patients prescribed telmisartan who accidentally missed a dose would still retain acceptable levels of BP control right through to their next dose including the risky early morning period of the second day.

The results presented here show that once-daily 80 mg telmisartan provides durable and significant reductions in SBP and DBP, which are sustained throughout the 24 h dosing period. These reductions in BP are significantly greater in magnitude than those achieved with the ARB valsartan (160 mg), particularly during the last 6 h of the dosing interval when incidences of BP-related complications are at their highest. Substantial differences in favor of telmisartan over valsartan during the first 4–6 h after active dosing were also apparent, which suggests that the activity of telmisartan is carried over from the previous dose and activity persists beyond the 24 h dosing interval. Moreover, telmisartan provides better 48 h protection against loss of BP control following a missed dose than valsartan, providing extra reassurance for patients who might occasionally forget to take their medication. Once-daily telmisartan is a well-tolerated and effective antihypertensive therapy, which offers full 24 h control of BP even in the event of a missed dose.

References