Real-world experience with ehealth telemonitoring in patients with hypertension

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Background
Hypertension is the strongest modifiable risk factor for cardiovascular disease worldwide, while incidence and prevalence remain high. Home-monitoring is known to improve blood pressure in patients with hypertension. Despite promising results, few home monitoring programs have successfully been integrated into daily care and little evidence exists on their cost-effectiveness. The Dutch HartWacht eHealth program, initiated in June 2016, is one of the first eHealth programs that is fully reimbursed and integrated into clinical practice.

Purpose
The purpose of the study is to demonstrate the effect of an integrated and cost-effective telemonitoring program in a real-life setting.

Methods
In the HartWacht program patients with uncontrolled hypertension (office BP >140/90) receive a blood pressure monitor that is connected to their smartphone and integrated with their personal electronic patient file. Measurements are checked by a dedicated health care team. If values exceed pre-defined thresholds, patients are contacted by the team for swift therapeutic action. In this study, the first results of the program are evaluated.

Comparisons were made between last office blood pressure before the program; average blood pressure of first week of home measurement (twice daily, morning and evening); and blood pressure of home measurement at three, six and twelve months after start.

Results
122 patients started the HartWacht program for hypertension (female: 57 (46,7%); mean age: 61,2 (±9,5) years; mean follow-up: 13,4 (±7,6) months; mean number of anti-hypertensive drugs at start of HartWacht: 1,8 (±0,9); mean number of medication changes per year during follow-up (including changes in dose): 1,0 (±1,6); mean number of contact moments per year during follow-up (including calls with nurse or cardiologist): 4,9 (±5,0)). At final follow-up, 67 patients participated at least one year. Others started later or stopped the program, mainly because of reaching normotensive values (n=22; home BP < 135/85).

The mean last office systolic blood pressure (SBP) measurement (n=122) was 157,9 mmHg (±19,2). The mean home SBP in the first week (n=120) was 139,9 mmHg (±13,9). After 3 months the mean home SBP lowered to 133,8 mmHg (±14,9), a significant decrease compared to week 1 (mean: 6,1 (±13,8), p<0,001). After this moment the mean home SBP was stable: 132,5 mmHg (±12,6) at six months (n=99) and 132,2 mmHg (±12,4) at 12 months (n=67).

No correlation was found between the number of medication adaptations and/or contact moments with the healthcare team and reaching target values.

Conclusion
This integrated eHealth telemonitoring program demonstrates significant and persistent blood pressure reduction in a real-life setting. As measurements are continuously monitored, swift therapeutic action is guaranteed. The Dutch HartWacht program has proven to be cost-effective, is reimbursed, and has the potential to be scaled up.
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