The Chronic Care Model: Will it Work in Malaysia for Hypertension?

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In this issue of the MJM a study has examined the concept of using the Chronic Care Model (CCM) in an integrated manner to optimise the management of hypertension [1]. The Chronic Care Model (CCM), a conceptual framework for the management of chronic disease has been in existence for over a decade. Many studies, particulary on diabetes, hypertension, heart failure, asthma, have taken some elements of the CCM to examine their effectiveness. However not many properly designed randomised control studies have been done that incorporates all the elements of the CCM, nor done specifically for the management of hypertension.

Having said that, there are many quality improvement evaluations based on the CCM that have been published. But these studies relied on data provided by participating teams rather than the more objective, externally collected evaluation of data. While these studies did show improvement on some process measures, and most also showed improvement on some intermediate outcome measures such as HbA1c, LDL cholesterol [2,3] because of the limitations in the study designs, it cannot be concluded that these improvements resulted solely from CCM-guided efforts.

Furthermore there were other studies that showed no differences in intermediate outcomes in similar parameters like the hemoglobin A1c or blood pressure levels [4,5]. However, when evaluated two years later a significant improvement in intermediate outcomes such as HbA1c and low-density lipoprotein (LDL) levels was noted [6]. While the CORFIS study did show an improvement by six months, it is very resource and labour intensive and whether this is sustainable over a long term period for a chronic asymptomatic condition like hypertension remains to be ascertained.

To confound the issue, other longer term studies based on usual care but without CCM, have also shown an improvement of blood pressure lowering of as much as - 10 mm Hg systolic blood pressure and - 7 mmHg in diastolic blood pressure over 10 years, as well as improvement in control rates from 15% to 43.7% [7] So again we cannot conclude that the improvement seen in studies using the CCM were a result of the CCM.

For any model of care to be effective in the management of hypertension, it must be able to lower BP to a greater quantum than the usual care currently in practice. What has been shown is that the reduction in blood pressure using the CCM has been quite modest of about –8 mmHg (95% CI: -8.8 to -7.2 mmHg) in systolic blood pressure and -4.3 mmHg (95% CI: -4.7 to -3.9 mmHg) in diastolic blood pressure [8]. In the CORFIS study, the absolute difference in BP lowering seen at the end of 6 months between the intervention group using CCM and the control group which is usual care, is only a lowering of -2 mm systolic and -3 mmHg diastolic in favour of the intervention group. While it is acknowledged that the baseline BP in the intervention group was higher than that of the usual care group (SBP 134 mmHg vs 130 mmHg) the absolute BP lowering in the intervention group after 6 months was still only -6 mmHg Systolic. This level of BP lowering can be easily achieved with the use of a single anti-hypertensive agent. And as is also seen in this study, (CORFIS) there was more use of the renin-angiotension group of drugs in the intervention group than in the control group at the end of 6 months. Hence how much of the improvements seen in this current study is due to more RAS inhibitor drugs used or to CCM may be open to question. Frequently the so-called uncontrolled hypertension that we see is a result of under-dosing or poor adherence rather than due to anything else. Often just by improving adherence and/or increasing or adding a second (or third) agent is sufficient to lower the BP to target without any need to resort to any other measures [7]. However for the patient to buy in to the addition of or to the increment in dose of their medication, the doctor needs to understand the patient's reluctance for such an addition or increment of drugs. We need to understand and hence ally the patient's fears where the addition of more drugs is seen as a signal by patients to be associated with end stage renal failure and hence renal dialysis.

Other interventions that have been studied have even more variable effects. Self-monitoring of BP is only associated with moderate net reduction in systolic blood pressure of -2.5 mmHg, (95% CI: -3.7 to -1.3 mmHg) and diastolic blood pressure of -1.8 mmHg, (95% CI: -2.4 to -1.2 mmHg). Results of randomised control trials (RCT) of educational interventions directed at patients or health professionals are mixed but is unlikely to be associated with large net reductions in blood pressure by themselves. Nurse or pharmacist led care appears to be a promising way forward, with the majority of RCTs being associated with improved blood pressure control and lower mean SBP and DBP. Appointment reminder systems also did increase the proportion of individuals who attended followup (odds ratio 0.41, 95% CI 0.32 to 0.51) and in two small trials also led to

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improved blood pressure control, (odds ratio 0.54 , 95% CI 0.41 to 0.73) but this strategy requires further evaluation as there are actually very few studies on appointmnet reminder systems and whatever studies there are, they were rather heterogenous [8].

These findings suggest that an organised system of registration, recall and regular review done together with a vigorous stepped care approach to antihypertensive drug treatment appears the most likely way to improve the control of hypertension. While a nurse or phmarmacist led care may contribute to control, this needs further evaluation, especially in the light of limited resoucres available to the primary care doctors in public sector and the non-existence of such resources to the general practitioners in the private sector in Malaysia.

However, taking all the evidence put together, there is a suggestion that some parts of the CCM may not be appropriate, effective or feasible to improve the management of hypertension in primary care. For example, measures like home blood pressure monitoring while widely believed to be effective in getting better control, is not the case as found in studies. At the best the blood pressure lowering is very modest at -2 mmHg sytolic BP [9]. A local study showed that while 35% of hypertensive patients of a primary care clinic owned a home BP set they did not make any adjustments to their medication but actually continued on the same dose although their BP was abnormal. Not unexpectedly there was also no significant association between HBPM and blood pressure control in this study population [10].

Because all these findings to date show only little, and at best modest improvement in blood pressure lowering, the question is whether it is cost effective to adopt such a model of care wholesale. It would require tremendous investments in technology infrastructure , re-organisation of the existing systems of care, proper training of other health care professionals like the nurse educator, laboratory support and the provision of an extended formulary for hypertension as well. All these will need huge monetary investment. And then the question of reimbursements for care that are not deeemd by patients or other payers to be "reimburseable" eg advice and counselling given by a nurse or dietitian also needs to be worked out.

The task here is to try to tease out which component of the CCM is most effective for the management of hypertension and apply that to a greater degree than the less effective components. And even if we managed to do that, an evaluation of the cost-effectiveness of any additional strategies that are going to be employed has to be carefully evaluated.

So unless the cost-effectiveness of CCM is well studied, it is not yet prime time for CCM in Malaysia. However this does not mean we cannot adopt the individual measures that have consistently been shown to work.

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