

## Salvaging Brain: New Concepts in the Management of Acute Stroke

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In few fields of medicine is the concept of care undergoing such a dramatic transformation as in the management of acute stroke. Major randomized clinical trials have provided reliable data refuting the nihilistic approach – which focused on assessing the damage rather than preventing it [1–5]. The professional quality of stroke care can no longer be measured by standards of clinical knowledge and diagnostic precision alone, but to a no lesser extent by the quality and speed with which effective therapy is methodically delivered to the acute stroke patient. The standard of stroke care is defined by effective implementation of clinical and critical pathways.

There is a large body of evidence demonstrating that stroke care in the framework of a dedicated stroke unit is associated with significant survival benefits, improved functional outcome, and reduced dependency and institutionalization when compared to conventional care [3,6–9]. It is not always straightforward, however, to pinpoint the specific interventions responsible for the superior outcome: while some stroke unit interventions, such as rapid implementation of reperfusion therapy, and greater adherence to processes of care are evidence-based, there remains uncertainty regarding the exact target values of basic physiologic variables such as blood glucose, blood pressure and body temperature [10–13].

In this issue of *IMAJ*, Royter et al. [14] comprehensively review current data on the effect of hyperglycemia on outcome of patients with acute ischemic stroke. Hyperglycemia is a common metabolic disturbance in the acute phase of ischemic stroke. Usually, the increase of plasma glucose levels is moderate and its decline occurs spontaneously [15]. Clinical studies of acute ischemic stroke support the conclusions of most experimental studies of focal cerebral ischemia in suggesting that admission hyperglycemia is associated with a worse clinical outcome [16]. The acute ischemic penumbra might be preferentially susceptible to injury in hyperglycemic ischemia. Indeed, magnetic resonance methods have shown that hyperglycemia in acute ischemic stroke promotes the evolution of hypoperfused tissue to infarction, which it does by increased brain lactate production [17]. This suggests that elevated glucose not only reflects the initial volume of infarcted tissue in the acute stage but is one of the true determinants of early infarct progression. The deleterious effect of hyperglycemia is more consistent in experimental models of focal cerebral ischemia that

is reversible [18], in non-lacunar strokes [19], and may be of particular importance in patients treated with early reperfusion therapy [19–24].

Hyperglycemia can be rapidly and relatively easily corrected and controlled. Active intervention with intravenous insulin to normalize blood glucose levels in patients with acute myocardial infarction or surgical patients requiring intensive care has been shown to substantially reduce mortality and morbidity [25,26]. However, the efficacy of immediate glycemic control in acute ischemic stroke has still to be corroborated in randomized controlled trials, while safety has been demonstrated in the setting of a controlled clinical trial [15].

So, in the interim, what treatment protocol for hyperglycemia in acute ischemic stroke should we adhere to? There are yet many unanswered questions regarding the specifics of which protocol to use, for how long, what the target glucose levels should be, and what intensity of monitoring is required. Particular caution is necessary to avoid hypoglycemia, specifically in a situation such as stroke characterized by the patient's altered ability to self-report symptoms. Nevertheless, accumulating evidence suggests that immediate restoration of normoglycemia should be encouraged. Local protocols for routine management of hyperglycemia should be established, addressing the potential risks of inducing hypoglycemia or potentiating hyperglycemia. Emerging data suggest that good stroke management includes not only early reperfusion therapy, which is indicated in the minority of patients, but also effective management of basic physiologic parameters, which is feasible in the majority. Moreover, in light of the growing use of new strategies for early reperfusion therapy in acute ischemic stroke [1–5], and the recent approval of intravenous recombinant tissue plasminogen activator in Israel, such protocols may be of particular value complementing reperfusion therapy.

In considering the new exciting treatment options it is important not to forget the constraints of reality in which we act. Attempts to isolate individual treatment principles from the setting of a well-designed stroke care program and to implement them sporadically are prone to fail. Reproducing results of management strategies proven effective in clinical trials into routine clinical practice requires generating the appropriate conditions, best provided in a setting of dedicated stroke units. There are no shortcuts to success.

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## Capsule

### Syphilis and HIV

Lynn and associates viewed some opinions on HIV and syphilis co-infection. HIV and syphilis affect similar patient groups and co-infection is common. All patients presenting with syphilis should be offered HIV testing and all HIV-positive patients should be regularly screened for syphilis. The syphilis agent may enhance the transmission of the other, probably through increased incidence of genital ulcers. Detection and treatment of syphilis can, therefore, help to reduce HIV transmission. Syphilis may present with non-typical features in the HIV-positive patient: there is a higher rate of symptomless primary syphilis and proportionately more HIV-positive patients present with

secondary disease. Secondary infection may be more aggressive and there is an increased rate of early neurologic and ophthalmic involvement. Diagnosis is generally made with serology but the clinician should be aware of the potential for false-negative serology in both primary and, less commonly, secondary syphilis. All HIV-positive patients should be treated with a penicillin-based regimen that is adequate for the treatment of neurosyphilis. Relapse of infection is more likely in the HIV-positive patient and careful follow-up is required.

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