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**Alcohol and type 1 diabetes: patient knowledge of alcohol-induced sustained hypoglycaemia**

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In type 1 diabetes alcohol can significantly reduce blood glucose 6-8h post-consumption [1] with increased risk lasting 24h [2]. Risk is dose-related and can be reduced with judicious carbohydrate consumption and long-acting insulin reduction where necessary [1]. There are, however, few studies assessing, firstly, easily available information and secondly, patients' knowledge in this area. We accessed and assessed National Diabetes Association guidelines, as typical information retrievable from an internet search for 'alcohol and type 1 diabetes' and also assessed knowledge of alcohol and hypoglycaemia in adults with type 1 diabetes by questionnaire.

Questionnaire items assessed knowledge of the hypoglycaemic effect of alcohol, duration of hypoglycaemia post-consumption and number of standard drinks perceived to cause hypoglycaemia. Standard drink quantity was depicted for comparison. Risk reduction (dietary or insulin modification) was not addressed to minimize prejudicing assessment of knowledge of hypoglycaemic effect *per se*. Questionnaire readability was 7.3 on Flesch-Kincaid Grade-Level score, thus understandable by a seventh grader. It was distributed to 50 consecutive adults with type 1 diabetes  $\geq 18$ y attending routine outpatient clinics; was anonymous, and consent was presumed by return to a designated sealed box.

Results: Information on alcohol and hypoglycaemia provided by 6 National Diabetes Associations [3-8] is shown in Table 1. All provided general information on alcohol and hypoglycaemia, eating with, and snacking after alcohol, and sustained hypoglycaemic effect, but the possible duration of hypoglycaemia varied from not specified to 16-24h. Only 2 guidelines provided information on reduction of long-acting insulin. Questionnaires were returned by 37 (74%) participants, exceeding the acceptable return rate of 65% for self-completed questionnaires [9]. Diabetes duration was  $16.5 \pm 11.9$ y and treatment was by basal-bolus (83.8%)/CSII(16.2%). The hypoglycaemic effect of alcohol was correctly identified by 88.2% of responders, but only 32.4% postulated duration of 4+h post-consumption. Standard drink quantity perceived to lower blood glucose level was: 1-3 (50%) and 4+ (41.2%). Study limitations were small sample size (50) and the notorious difficulty of obtaining accurate information on alcohol consumption. We aimed to maximise accuracy by the proven strategy of anonymity [10] and assessment of knowledge rather than behaviour.

Conclusions: Knowledge of alcohol and hypoglycaemia was acceptable in this group, except in the important area of duration of alcohol-induced hypoglycaemia. This is congruent with accessed

guidelines and may reflect an identified lack of consistency in information given to patients regarding alcohol-induced hypoglycaemia [2]. Additionally not all guidelines provided information on reduction of long-acting insulin, an important strategy to minimize hypoglycaemic risk.

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Table 1 Alcohol and insulin: information provided by guidelines

National Association	Potential hypoglycaemic effect	Duration of hypoglycaemia	Information provided				Recommends further Information
			Food with alcohol	Snack later	Possible insulin reduction		
American Diabetes Association	y	<ul style="list-style-type: none"> <li>• y/n</li> <li>• time</li> </ul>	y	y	n	y	
Canadian Diabetes Association	y	<ul style="list-style-type: none"> <li>• y</li> <li>• up to 24 h</li> </ul>	y	y	n	y	
Diabetes Australia	y	<ul style="list-style-type: none"> <li>• y</li> <li>• up to 24h</li> </ul>	y	y	y	y	
Diabetes New Zealand	y	<ul style="list-style-type: none"> <li>• n</li> <li>• n.s</li> </ul>	y	n	y	y	
Diabetic Society Singapore	y	<ul style="list-style-type: none"> <li>• y</li> <li>• n.s</li> </ul>	y	y	n	y	
Diabetes UK	y	<ul style="list-style-type: none"> <li>• y</li> <li>• up to 16 h</li> </ul>	y	y	n	y	