

Clinical characteristics and risk factors of feeding intolerance in twin preterm infants

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Keywords:

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eating; weight loss

ABSTRACT

To investigate the clinical characteristics and risk factors for feeding intolerance (FI) in preterm infants and to provide evidence for early identification, effective prevention and treatment of FI. A total of 116 preterm infants were recruited in the Department of Neonatology, West China Second Hospital, Sichuan University, from July 2016 to December 2016. Self-designed "the clinical observation table for feeding intolerance of preterm infant" was used to find out the main risk factors of FI in preterm infants. There were 62 cases of FI. The incidence of FI in preterm infants was 53.45% (62/116). It was 44.93% (31/69) and 65.96% (31/47) for males and females, respectively, with significant difference between them ($P < 0.05$). The incidence of FI in very low birth weight infants was 48.57% (34/70), and in the extremely low birth weight infant was 88.89% (8/9). FI in preterm infants mainly occurred in the period of being fed within 48-72 h. The symptoms included abdominal distension, gastric retention, vomiting and stomach brown color for clinical manifestations. Among them, abdominal distension was the main clinical manifestation. The logistic multivariate regression analysis showed that birth weight $< 1\ 000\ g$ ($P < 0.05$), the use of caffeine citrate ($P < 0.05$) and the formula feeding ($P < 0.05$) were the main risk factors for FI. The incidence of FI is very high in preterm infants. Birth weight $< 1\ 000\ g$, the use of caffeine citrate, and formula feeding are main risk factors for FI.



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1. INTRODUCTION

In the past decades, the rate of general and abdominal obesity has increased markedly among Chinese adults [1]. In 2019, more than 50% adults aged 18 or above were classified as overweight or obese according to body mass index (BMI) [2]. The number of Chinese people with overweight or obesity is estimated to grow to 790 million in 2030 [3]. As an established risk factor of cardiometabolic diseases, the obesity epidemic has increased the burden on the medical system in China [4]. By 2030, the medical cost attributed to overweight and obesity in China is predicted to be USD 61 billion [3]. Furthermore, at the same BMI values, Chinese individuals are at higher risk of cardiometabolic diseases than Black and White adults in the US [5]. Developing effective strategies for obesity prevention and management is important in the Chinese

population.

Various forms of fasting have been developed, including intermittent fasting (IF), calorie restriction, long-term fasting, very low-calorie diet, and fasting-mimicking diet [6]. In recent years, IF has been an emerging dietary intervention for weight management. IF refers to diverse recurring eating patterns that require fasting for different time periods, ranging from hours to a few days [7], which includes alternate-day fasting (ADF), periodic fasting, and time-restricted eating (TRE). Previous studies demonstrated the potential benefits of IF with respect to obesity, insulin resistance, dyslipidaemia, hypertension, and inflammation [8], [9].

Although IF is a potential weight management strategy, its efficacy may vary by dietary habits in the study population because of the adherence issue. A recent study reported that the average eating window of 1596 Chinese adults was 13.03 h, in which 45% of individuals commenced eating at 8:00–9:00 a.m., and 52% of participants ceased eating at 8:00 p.m. [10]. According to NHANES 2009–2014, the average eating window, first mealtime, and last mealtime of 15,341 adults aged 20 or above were 12.2 ± 0.06 h, 8:08 a.m., and 8:18 p.m., respectively [11]. With a potentially longer eating duration in the Chinese population than in the US, conducting IF by restricting the eating window may not have the same efficacy. In addition, whether IF is beneficial mainly because of calorie restriction is unclear. A one-year randomized controlled trial (RCT) with 139 Chinese participants found that early TRE (8:00 a.m. to 4:00 p.m.) combined with daily calorie restriction had similar effects as calorie restriction only on weight loss and body fat reduction in people with obesity [12], but more trials in the Chinese region are warranted to verify the finding.

In brief, the previous literature suggested a lack of systematic review of the efficacy of IF in improving cardiometabolic health of the Chinese population and whether the potential benefit of IF is independent of calorie restriction during the intervention. Gaining additional understanding on the efficacy of IF in the Chinese population may help health care professionals formulate evidence-based weight loss plans for individuals who are overweight and obese.

2. Materials and Methods

This meta-analysis was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 statement [13]. The study protocol was registered in PROSPERO (CRD42022359891).

2.1 Search Strategy

Five databases, namely, Ovid MEDLINE, Embase (via Ovid), Ovid Emcare, WanFang, and the China Academic Journal Network Publishing Database (CNKI) were used to identify relevant RCTs that investigated the efficacy of IF on Chinese populations up to October 2022, using a combination of keywords related to IF (e.g., intermittent fasting or time-restricted feeding or periodic fasting) and RCT (e.g., RCT or clinical trial or controlled clinical trial or randomization or random assignment). Reference lists of the included studies were also retrieved for potential eligible studies. The details of the search terms that were used are summarized in Table S1.

2.2 Study Selection

Two independent reviewers (KC and KL) were involved in the two-stage process for the selection of studies. After duplicate studies were excluded, the titles and abstracts were first screened. The abstracts followed by full contents of studies that met the pre-specified eligibility criteria were assessed with reference to the inclusion and exclusion criteria.

3. Conclusion

Among Chinese adults, adopting IF for at least three weeks can result in some degree of weight loss and improvement in cardiometabolic health. IF may have potential roles in weight management, but more well-designed studies are necessary to provide robust evidence of its effects on weight management by considering the effects of sex and meal timing and to account for the dietary habits of the Chinese population. Moreover, the possible adverse incidents and long-term effects of IF interventions need to be studied by conducting more long-term and large-scale clinical trials.

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