

# Insulin misuse: A special type of disordered eating behaviour in girls and young women

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## Article points

1. Negative female body image is commonplace, greatly caused by Western cultural influences to achieve a thin body ideal.
2. Negative body image is most prevalent in girls and young women.
3. Females with type 1 diabetes may be further predisposed to developing negative body image, by nature of the disease.
4. Insulin misuse is a disordered eating behaviour unique to individuals with type 1 diabetes.
5. Insulin misuse results in rapid weight loss and potentially life-threatening short- and long-term diabetes-related complications.

## Key words

- Body image
- Disordered eating behaviour
- Girls and young women
- Insulin misuse
- Type 1 diabetes

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**Girls and young women are commonly affected by negative body image, greatly influenced by Western cultural ideals (Kjærbye-Thygesen et al, 2004; Presnell et al, 2004; Glauert et al, 2009; Girlguiding UK, 2010); this has been implicated in the development of disordered eating behaviour (DEB; Kelly et al, 2005). Females who have type 1 diabetes are not immune, by nature of their health status, to these cultural influences; in fact, the potential for them to develop a negative body image is heightened. The method in which girls and young women engage in DEB is also unique, as the misuse of insulin leads to rapid body weight loss (Crow et al, 1998; Peveler, 2000). Insulin misuse appears to be common practice among females with type 1 diabetes affected by negative body image (Jones et al, 2000; Neumark-Sztainer et al, 2002). As a result of the devastating complications associated with poor glycaemic control resulting from insulin misuse, it is essential for healthcare professionals to recognise the importance of this problem in order to support girls and young women with type 1 diabetes to achieve a healthy body image.**

In current Western culture there is a drive for females to achieve the thin body ideal, which is for many below their normal body weight; this subsequently leads to the development of a negative body image (Kjærbye-Thygesen et al, 2004; Glauert et al, 2009). It is primarily during childhood and adolescence when females develop a negative body image (Kjærbye-Thygesen et al, 2004; Girlguiding UK, 2010), which often coincides with the diagnosis and management of type 1 diabetes (International Diabetes Federation [IDF], 2009).

This article explores the development of negative body image in girls and young women with type 1 diabetes, which may manifest into a unique disordered eating behaviour (DEB) – insulin misuse. The aim is to provide healthcare professionals involved in the care of young females with type 1 diabetes with insight into this problem, so that they are aware

of and recognise the importance of the potential manifestation of negative body image, in order to deliver essential holistic and humanistic care.

Prevention and treatment of this complex problem is beyond the scope of this article, and as such will be addressed in future articles. While it is acknowledged that females living in cultures other than Western society, and indeed males, who have type 1 diabetes may also be affected by negative body image, the limitations of this article prevent such broad consideration. The focus on girls and young women living in Western culture intends to ensure a focus that is relevant to current clinical practice.

## Body image

Body image is a central aspect of self-concept (Kreuger, 2002); it describes how a person internally sees her own body – weight, shape, size,

function and capabilities (Cash and Pruzinsky, 2002). A person will reflect upon and compare her body image with social influences, and adjust her perception accordingly (Sands, 2000). In current Western culture, the female body that is portrayed in the media as ideal is one with an exceptionally thin physique (Kjærbye-Thygesen et al, 2004).

### Negative female body image

Opening popular women's magazines, such as *Cosmopolitan* (2011) and *Harper's Bazaar* (2011), exposes a visual barrage of "size-zero" females, which we feel we must aspire to become. In addition, Kjærbye-Thygesen et al (2004) and Presnell et al (2004) highlighted that appearance, and as such attainment of the female body ideal, symbolises success within Western culture. In reality, however, it is difficult for many females to achieve this ideal, resulting in a negative body image (Kjærbye-Thygesen et al, 2004; Presnell et al, 2004; Glauert et al, 2009). For females in the general population, negative body image has been implicated in the development of DEB, manifesting in extreme dieting and conditions such as anorexia nervosa and bulimia nervosa in order for them to attain this body ideal (Kelly et al, 2005).

### The age of importance

In 2010, the Girls' Attitudes Survey, which included over 1200 girls and young women, reported that 8% of girls aged 7–11 years would like to be thinner; this figure increased with age to 21% of those aged 11–16 years and 33% of those aged 16–21 years (Girlguiding UK, 2010). The over-riding reasons given for being on a strict diet by the girls and young women surveyed was to be more attractive to others and because of the way in which the media portrays women (75% and 66%, respectively; Girlguiding UK, 2010). These findings were further supported by Presnell et al (2004) and Kjærbye-Thygesen et al (2004), who found that up to 43% of young females reported body dissatisfaction, despite being within the normal, healthy range on the body mass index (BMI) scale; as body satisfaction increased as BMI decreased, those girls who were most satisfied were consequently underweight (Presnell et al, 2004).

### Type 1 diabetes and negative female body image

The potential for girls and young women who have type 1 diabetes to develop a negative body image is multifactorial and vast. Primarily, it must be acknowledged that these females, despite their health status, are influenced by the same issues and pressures associated with body image as females in the general population. The principal influences, such as BMI, thinking about food, and life events, which are unfortunately an integral aspect of type 1 diabetes, and the development of DEB are discussed below.

### BMI

In addition to cultural pressures and aspirations to achieve the female thin body ideal, people with type 1 diabetes have a tendency towards a higher BMI (Jones et al, 2000; Kruger and Kulkarni, 2007). Insulin is a growth and anabolic hormone; furthermore, it inhibits lipolysis by acting on adipocytes (Kruger and Kulkarni, 2007). As a consequence, insulin therapy is associated with increased body fat and fat-free body mass (Diabetes Control and Complications Trial [DCCT] Research Group, 2001; Kruger and Kulkarni, 2007). Presnell et al (2004) reported that BMI was inextricably linked to body satisfaction; females who had a higher BMI reported greater body dissatisfaction. Fluctuations in body weight have also been associated with negative body image (Kjærbye-Thygesen et al, 2004). As a consequence of insulin therapy and subsequent achievement of good glycaemic control, often leading to a higher than desired BMI, females who have type 1 diabetes are therefore predisposed to negative body image (Peveler, 2000; Olmsted et al, 2008).

### Thinking about food

The intense dietary focus, avoidance of high sugar foods and carbohydrate counting, which are inherent aspects of diabetes management, may also induce an unhealthy heightened awareness and focus on diet and body weight (Crow et al, 1998; Peveler, 2000; Kelly et al, 2005; Olmsted et al, 2008). It has been accepted that such attention to diet is necessary in diabetes management, and is not essentially a symptom of DEB or desire to lose weight as a result of negative body image (Crow et al, 1998; Kelly et al,

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### Page points

1. The diagnosis of a life-threatening condition has a substantial psychological effect on the person; risk factors for negative body image in females have been established to include severe events early in life, poor physical form and reduced self-rated health.
2. It can be extrapolated that diagnosis of type 1 diabetes and the subsequent health status of the individual could constitute a number of these risk factors.
3. Evidence presented in the literature has strongly suggested that girls and young women who have type 1 diabetes not only share the risk factors of their peers but also the clinical characteristics of the disease, and its management may further predispose them to developing negative body image and subsequent disordered eating behaviour.

2005). It must be remembered, however, that as girls and young women who have type 1 diabetes are not immune to the risk factors for developing negative body image and DEB, the acceptance of a “food focus” as part of diabetes management may actually conceal co-existing DEB.

### Life events

Guthrie et al (2003) highlighted that diagnosis of a life-threatening condition has a substantial psychological effect on the person. Risk factors for negative body image in females have been established to include severe events early in life, poor physical form and reduced self-rated health (Kjærbye-Thygesen et al, 2004). The onset of type 1 diabetes is often sudden, with a rapid and critical deterioration in health status of the individual (Bilous and Donnelly, 2010). Daily, lifelong insulin, administered subcutaneously, is therefore necessary to sustain life for people diagnosed with this condition (Fullerton et al, 2011). It can be extrapolated that diagnosis of type 1 diabetes and the subsequent health status of the individual could constitute a number of these risk factors.

To compound the problem, diagnosis of type 1 diabetes often occurs before adulthood (IDF, 2009), when girls are most susceptible to developing negative body image (Crow et al, 1998; Kjærbye-Thygesen et al, 2004; Girlguiding UK, 2010). It is consequently strongly suggested that girls and young women who have type 1 diabetes not only share the risk factors of their peers but also the clinical characteristics of the disease, and its management may further predispose them to developing negative body image and subsequent DEB.

### Prevalence and type of DEB

The only recent, methodologically robust research conducted to establish the prevalence of DEB in girls and young women with type 1 diabetes was a large cross-sectional study conducted by Jones et al (2000). They found that females who had type 1 diabetes were 2.4 times more likely to have a clinical eating disorder than those without diabetes. Additionally, subthreshold eating disorders were also found to be 1.9 times more common in these girls and young women. The most common method of weight loss reported, apart from dieting, was the misuse of insulin (Jones et al, 2000).

### Insulin misuse: a method of weight control

The misuse of insulin was described by Crow et al (1998) as the deliberate omission or reduced administration of insulin than is required. This results in hyperglycaemia and subsequent glucosuria, which leads to a rapid reduction in body weight (Crow et al, 1998; Peveler, 2000). In an early study, Affenito et al (1998) reported that insulin misuse was the most common method of weight control used by females with type 1 diabetes, accounting for 44% of those with a clinical or subthreshold eating disorder. In a slightly larger and more recent study focused on adolescents with type 1 diabetes, 37% of the young women reported engaging in DEB, of whom up to 10.4% misused insulin to control their weight (Neumark-Sztainer et al, 2002); this high frequency of insulin misuse has been corroborated in several studies (Bryden et al, 1999; Pollock-BarZiv and Davis, 2005).



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### Complications associated with insulin misuse

DEB in girls and young women with type 1 diabetes has been found to be associated with poor glycaemic control, illustrated by higher HbA<sub>1c</sub> values (Affenito et al, 1998; Bryden et al, 1999; Neumark-Sztainer et al, 2002). In a 2-year follow-up study of females with co-morbid type 1 diabetes and an eating disorder, those who engaged in insulin misuse were specifically identified as having poorer glycaemic control than those who did not misuse insulin (Herpertz et al, 2001). Similar findings by Colton et al (2007) supports the proposition that it is insulin misuse specifically that affects glycaemic control.

The detrimental effect of insulin misuse on the individual's health status must not be underestimated; in essence insulin misuse returns the individual physiologically to the untreated health status of type 1 diabetes (Pollock-BarZiv and Davis, 2005).

### Short-term complications of insulin misuse

Insulin misuse results in hyperglycaemia, which in turn can result in diabetic ketoacidosis (DKA; Peveler, 2000; Bilous and Donnelly, 2010). In a 12-year follow-up study of 87 females, 24% of adolescents and 11% of young women had been admitted to hospital more than once for DKA, which was statistically significantly related to insulin misuse (Peveler et al, 2005). In a study of 108 deaths in individuals under the age of 30 years who had type 1 diabetes, 44% were as a result of complications of diabetes (Feltbower et al, 2008). The largest proportions of these deaths were as a result of acute complications, and DKA and hyperglycaemia were recorded as the most common cause of death (Feltbower et al, 2008). The potential for insulin misuse to result in DKA and subsequent death of the individual is a valid concern when considering the frequency of this method of weight control used by girls and young women.

### Long-term complications of insulin misuse

The long-term complications associated with insulin misuse are as a direct consequence of poor glycaemic control. Microvascular, macrovascular and neurological complications develop in people with type 1 diabetes who have poor glycaemic

control at an increased rate and severity when compared with those who achieve good glycaemic control (DCCT Research Group, 1993; Snell-Bergeon et al, 2003; DCCT/EDIC [Epidemiology of Diabetes Interventions and Complications] Research Group, 2005). Indeed, Peveler et al (2005) reported that 48% of the females who developed serious microvascular complications during their follow-up study had a history of insulin misuse.

### Conclusions

In addition to Western cultural influences, the clinical characteristics of type 1 diabetes and its management compound the risk factors for negative female body image. Negative body image has been implicated in the development of DEB, and girls and young women with type 1 diabetes have available to them a unique method of weight control – insulin misuse (Crow et al, 1998; Kelly et al, 2005). While insulin misuse provides a method of rapid weight loss, the consequent deterioration in glycaemic control is associated with serious short- and long-term health complications, which can be devastating (Neumark-Sztainer et al, 2002; Peveler et al, 2005; Takii et al, 2008). As such, it is of paramount importance to support girls and young women with type 1 diabetes to achieve a healthy body image, and to identify, prevent and treat DEB and insulin misuse.

A revised version of the diabetes eating problem survey (DEPS) for use with adolescents was found to have excellent internal consistency and external validity (Markowitz et al, 2010). This screening tool may be a useful and much-needed method of assisting practitioners to identify females at risk of, or engaged in, DEB (Markowitz et al, 2010). Recognising those females affected at an early stage, alongside prompt referral for multidisciplinary support and specialist services, is crucial for effective recovery (NICE, 2004). The methods of identification, prevention and treatment approaches to this unique problem will be analysed further in subsequent articles.

The first step, however, is to recognise that they are girls and young women who are not immune by nature of their health status, but actually more susceptible, to the same cultural influences as the remaining population. ■

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