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GB Apprentice Jockeys Do Not Have the Body Composition to Make Current Minimum Race Weights: Is It Time to Change the Weights or Change the Jockeys?

GB apprentice jockeys do not have the body composition to make current minimum race weights: is it time to change the weights or change the jockeys?

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Abstract

Flat jockeys in GB are classified as apprentices if aged <26 and/or have ridden <95 winners. To gain experience, apprentices are allocated a weight allowance of up to 7lb (3.2kg). Given that there is no off-season in GB Flat horseracing, jockeys are required to maintain racing weight all year round. In light of recent work that current apprentices are considerably heavier than previous generations with smaller increases in minimum weight, the aim of this study was to assess if minimum weight in GB was achievable? To make minimum weight (50.8kg) with maximal weight allowance, requires a body mass of ~46.6kg whilst maintaining fat mass >2.5kg (the lowest fat mass previously reported in weight restricted males). Thirty two male apprentice jockeys were assessed for body composition using DXA. Mean (SD) total mass and fat mass were 56kg (2.9) and 7.2kg (1.8) respectively. Given that the lowest theoretical body mass for this group was 51.2kg (2.3), only 1/32 jockeys was deemed feasible to achieve the minimum weight with their current weight allowance, and maintaining fat mass >2.5kg. Furthermore, urine osmolality of 780 mOsmol/L (260) was seen with 22/32 jockeys classed as dehydrated (>700 mOsmols/L), indicating body mass would be higher when euhydrated. Additionally, we observed that within new apprentice jockeys licensed during this study (N=41), only 1 jockey was able to achieve minimum weight. To facilitate the goal of achieving race weight with minimal disruptions to wellbeing, our data suggest that minimum weight for GB apprentices should be raised.

Keywords: **Jockey, Fat mass, Body mass, Weight-making, Hydration, Athlete Welfare**

Introduction

Apprentice jockeys are young inexperienced jockeys at the start of their racing career aged under 26 years and/or having ridden less than 95 winners. As an incentive for racehorse trainers to employ an apprentice jockey over a more experienced rider to race ride, apprentices are allocated weight allowances (known in the industry as a 'claim') to reduce the racing weight on the horse and consequently improving the horse's competitiveness (Wilson et al., 2014). Apprentices are therefore under additional pressure to make the lightest of racing weights due to the 'claim' in comparison with their senior counterparts (Cullen et al., 2015; Martin et al., 2017; Wilson et al., 2014). Furthermore, with the recent advent of all-weather and floodlit Flat racing in Great Britain (GB) there is no off-season for flat jockeys and hence, there is the additional challenge of being required to make weight all year round (Martin et al., 2017; Wilson et al., 2014). The weight allowance given to apprentices in GB Flat horseracing is allocated based upon the number of winning rides for each jockey, with 7lb (3.2kg) , 5lb (2.3kg) and 3lb (1.4kg) being allowed until he/she has ridden 20, 50 and 95 winning races, respectively. Considering that the minimum flat racing weight in GB is 50.8kg, this effectively means that a young apprentice who is eligible to the highest 'claim' of 3.2kg, in order to make the reduced minimum weight 47.6kg, will be required to have a total body mass of ~46.6kg, taking into account the additional weight for lightest racing accessories (boots, breeches, silks, saddle) (Martin et al., 2017; Wilson et al., 2014).

Establishing a minimum absolute amount of body fat for health in humans is, of course, highly problematic and complicated by the lack of generally accepted definitions. In an attempt to establish this minimum essential body fat classification, Friedl et al (1994) induced a 10% body mass loss over 8 weeks in healthy military personal during an intensive Ranger course combined with severe calorie restriction, whilst also assessing changes in body composition using DXA. It was reported that 2.5kg of absolute body fat was the lowest achievable fat mass without unacceptable losses of lean muscle mass along with such severe food cravings that the study could not continue. Indeed, when 2.5kg of body fat was achieved, the majority of the energy from body stores was derived from fat-free mass suggesting significant muscle catabolism. Whilst these data are by no means suggesting 2.5kg is a healthy absolute amount of body fat for all individuals, it can be concluded that it is unwise to reduce body fat to lower than 2.5kg without compromising health. In reality, few athletes will ever achieve such low body fat and still be able to perform optimally. Indeed, in our previous work from > 300 male jockeys, the lowest absolute fat mass observed was 3.7kg (Wilson et al., 2018).

Using data obtained from apprentice jockeys presenting to our laboratory over an 20 month period, a retrospective study was undertaken to assess if this group of apprentice jockeys were able to achieve the minimum riding weights with their individual 'claim' at the time of testing, whilst maintaining at least 2.5kg of body fat. Additionally, we accessed height and weight data on newly licensed male apprentice jockeys from the British Horseracing Authority (BHA), to assess numbers amongst this group who were able to race ride at minimum weight. It was hypothesised that the apprentice jockeys tested would not be able to make minimum riding weight accounting for their current 'claim' whilst maintaining euhydration and maintaining absolute fat mass greater than the theoretical minimum safe level of 2.5 kg. It is hoped that the results from this research will provide essential information to key stakeholders involved in horseracing with regards to the long term health and safety of apprentice jockeys.

Methods

Thirty two male apprentice flat jockeys (mean [SD] age 19yrs [1.8]; height 169cm [4.7]; mass 56.0kg [2.9] who at the time of testing were race riding in Great Britain (GB) on a regular basis and free from injury, consented to participate in this study. Prior to testing, apprentice jockeys were given participant information and provided written informed consent that had been granted National Research Ethics Service approval (14/NW/0155).

Following an overnight fast, apprentice jockeys underwent measures of height and weight using a dual height/weight stadiometer (SECA, Germany) barefoot wearing minimum clothing along with body composition using Dual-energy X-ray Absorptiometry (DXA) (Hologic, USA) following the procedure as described in Wilson et al., (2018). In addition, apprentice jockeys provided a mid-flow urine sample and were tested for urine osmolality (UO) using a hand-held refractometer (Osmocheck, Vitech, USA) as an indicator of hydration status (Sparks & Close, 2013). The testing was conducted over a 20 month period from July 2017 up and until March 2019, at the Research Institute for Sports and Exercise Sciences, Liverpool John Moores University. For each jockey tested, data were analysed to assess if the jockey would be able to make minimum riding weight (50.8 kg) with their current 'claim' (3.2, 2.3, or 1.4kg) at baseline body mass and then again with body fat adjusted to 2.5kg. This group represented ~ 20% of the total male apprentice population licensed to race ride during this period (n=162).

Additionally, as part of the jockey licensing process, apprentices are assessed for height and weight using a dual height/weight stadiometer (SECA, Germany) barefoot wearing minimum clothing and this information on 41 newly licensed male apprentice jockeys was provided by the British Horseracing

Authority (BHA) (mean [SD] age 18yrs [1.8]; height 165cm [5]; mass 51.9kg [3.2]. Using the data provided by the BHA we assessed how many jockeys from this additional 41 group could achieve minimum weight with the allocated maximal 'claim' (3.2kg). This group represented ~26% of the male apprentice jockeys available for testing during our study period.

Results

A comparison of the body composition of GB apprentice jockeys tested at LJMU, and the current minimum flat racing weight in GB, factoring in the various riding allowances is presented in Table 1. Of the 32 apprentice jockeys tested, only one jockey at baseline reported with a body mass ≤46.6kg allowing him to achieve the minimum race riding weight with his current 'claim'. For all the other jockeys, even at the theoretical minimum body fat of 2.5kg, no additional jockeys were able to make the lowest riding weight of 50.8kg. Only 9 of the 32 jockeys presented with UO of <700 mOsmol/L (Table 1). From analysis of newly licensed apprentice jockeys baseline weight data only 1 of the 41 jockeys could make minimum weight taking into account the allocated maximal 'claim' of 3.2kg for this group.

Discussion

The aim of the present study was to assess the feasibility of apprentice jockeys riding in GB to achieve the current minimum weights whilst taking into consideration their allocated 'claim'. To this end, we recruited 32 apprentices and assessed their body composition using DXA and compared against the minimum racing weights with a 'claim'. We report for the first time that the majority of jockeys tested are unable to make weight whilst maintaining a minimum of 2.5kg of absolute fat mass. In addition, we report that the majority of newly licensed apprentices, similarly, are unable to make minimum race weight Therefore racing authorities in GB should consider increasing minimum weights or potentially recruit smaller jockeys.

It has been reported that apprentice jockeys in the last decade are significantly heavier (~37%) than previous generations (Dolan et al., 2011) despite trivial increases (~6%) in minimum racing weight (Warrington et al., 2009). To achieve such low riding weights, many jockeys utilise deleterious techniques to make weight largely based upon dehydration, sporadic eating and in extreme cases forced vomiting (Wilson et al., 2014). Despite published guidelines (Martin et al., 2017) now being available to help jockeys reduce their fat mass to make weight (Wilson et al., 2012; Wilson et al., 2015), it is still not known if it is possible for jockeys to achieve their lowest required riding weight whilst maintaining a "healthy" amount of body fat and remaining hydrated. Whilst there are no accepted definitions as to what constituents a minimum absolute amount of body fat, data on military personnel has suggested that 2.5kg causes significant muscle catabolism along with feelings of hunger that it was no longer tolerable even in highly motivated military personal (Friedl et al., 1994). As such, we used this figure of 2.5kg of absolute fat mass as a theoretical minimum amount of body fat for jockeys undergoing testing, although in reality such low levels are unlikely to be achieved in athletes including jockeys. From our own studies over the past decade with over 300 professional male flat and jump jockeys, the lowest body fat we have observed in any male jockey was 3.7kg (range 3.7kg to 10.4kg) (Wilson et al., 2018). Moreover, using the theoretical minimal absolute body fat of 2.5kg, we report herein that only one jockey out of the 32 had the capacity to make the minimum riding weight. Additionally, it should be noted that this jockey also presented with a urine osmolality of 850 mOsmol/L suggesting some degree of dehydration (Sawka et al., 2007) and whether he would have been able to make minimum weight euhydrated remains unclear?

Given that the present data suggests the majority of apprentices were unable to make minimum weights, it is interesting to speculate what would be a more realistic target. Following a 6 week structured dietary intervention in jockeys that resulting in a daily 500-1000kcal deficit, the lowest

absolute amount of body fat reported was 5kg (Wilson et al., 2015). As such, it could be suggested that it is more realistic to set a minimum fat mass target of ~5kg for professional jockeys. When considered this way, this would allow 26 of the 32 jockeys tested to reduce body fat following a structured diet and exercise regime. However, even if this more realistic fat mass target was achieved, there would still only be one jockey capable of achieving the current minimum race weight of 50.8kg, despite only 9 of the 32 jockeys presenting for testing euhydrated. On the basis of using 5kg as a realistic minimum amount of body fat for jockeys which, given that the mean absolute body fat of the group was 7.2kg with a mean mass of 56kg, we would propose a minimum riding weight of ~53.8kg (56kg -2.2 kg body fat reduction = 53.8kg) which in-fact aligns with the current minimum race weight in other major racing authorities such as Australia and New Zealand (Wilson et al., 2014). This suggesting now needs further exploration in a larger sample size of apprentice jockeys. It is also interesting to speculate with regards to a maximum height of apprentice jockeys which would allow them to make weight safely. Through re-analysing our previous data (Martin et al., 2017; Wilson et al., 2013; Wilson et al., 2018) along with the data presented here, the mean height of apprentice male jockeys, (with a body fat mass of ~5kg) that would enable them to make minimum race weight of 53.8kg is ≤166cm.

In addition to those apprentices that underwent testing, we accessed data on newly licensed male apprentices outside of this study in order to assess if greater numbers of apprentices also had issues in making minimum weight. For each individual jockey, at licensing their weight is then registered in the industry publications and therefore it is beneficial for newly licensed jockeys to present as light as possible in order to be available for more race ride opportunities. Likewise, with the tested group, the vast majority of newly licensed jockeys, who by definition are eligible to the maximal 'claim' of 3.2kg, are unable to make minimum weight with only 1 of the 41 apprentices reporting with a baseline body weight to achieve this. The findings here strengthen our previous suggestions of either increasing minimum weight or recruiting smaller jockeys.

Despite providing novel data, this rapid communication is not without its limitations. Although we reported on two groups of apprentices, it is important to note that these groups represent a fifth and a quarter of all male apprentices available during the study period, respectively, and therefore that there may be apprentices who do not have weight issues, and in the case of those who underwent testing, do not require weight management advice. However, we do highlight that only 1 apprentice in each group had a body mass to achieve minimum weight with their allocated 'claim'. Whilst we

acknowledge that for the newly licensed group we only have access to height and weight data, using the average for the group (165cm and 51.9kg respectively) and calculating BMI at current minimum weight of 46.6kg with 'claim' (3.2kg) this would result in a BMI of 17.1 which is at the very low end of the underweight scale. Additionally, although current DXA recommendations suggest that athletes should present fasted and euhydrated (Nana et al., 2015), we acknowledge that many jockeys were dehydrated when scanned which could have affected the accuracy of the DXA scans (Bone et al., 2017).

In summary, we propose, 1) the racing authorities may wish to consider increasing the minimum weight for Flat jockeys, possibly to 53.8kg which would bring GB in line with other nations and (if adopting the increased weight) set a maximum height target of apprentice recruits at ≤166cm, 2) consider revising the system of weight allowances and/or, 3) actively recruit potential jockeys who have the anthropometric profile to allow them to make minimum weight safely. In acknowledgment of the potential limitations of sample size in each group, we therefore also suggest that future studies could be strengthened if testing was made a mandatory prerequisite to licensing/re-licensing for all jockeys with the data then used to allocate each jockey their own minimum riding weight.

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TABLE 1: Baseline body composition assessment from Dual-energy X-ray Absorptiometry (DXA), Urine Osmolality (UO) and adjusted fat mass, and assessments to make individual minimum weight with current claim allowance at time of testing of male apprentice GB Flat jockeys. * indicated mass once body fat was adjusted assuming a total body fat of 2.5kg

ID	Age (yrs)	Height (cm)	Weight (kg)	Fat mass (kg)	Lean Mass (kg)	Claim (kg)	Hydration UO (mOsmol/L)	Minimum weight	Y/N	*2.5kg	Minimum weight Y/N
1	22	163	55.9	6.3	45	2.3	780	47.5	N	52.1	N
2	20	163	54.9	3.9	45.9	2.3	860	47.5	N	52.5	N
3	22	169	58.9	8.9	45.4	1.4	750	48.4	N	52.5	N
4	20	166	53.7	5.7	43.1	3.2	950	46.6	N	50.5	N
5	19	163	51.8	4.1	42.6	3.2	200	46.6	N	50.2	N
6	19	178	60	6.5	48.6	2.3	1070	47.5	N	56	N
7	17	165	46.6	5.1	36.9	3.2	850	46.6	Y	44	Y
8	19	174	55.6	7.1	43.8	3.2	1000	46.6	N	51	N
9	19	176	54.2	6.6	42.8	2.3	930	47.5	N	50.1	N
10	16	167	59.6	10.4	44	3.2	480	46.6	N	51.7	N
11	17	170	55.2	9.3	40.8	3.2	920	46.6	N	48.4	N
12	20	169	57.6	8.8	43.7	2.3	800	47.5	N	51.3	N
13	18	165	53.2	7.2	40.5	3.2	760	46.6	N	48.5	N
14	17	167	55.2	6.9	42.8	3.2	700	46.6	N	50.8	N
15	19	167	59	7.7	46.3	1.4	1080	48.4	N	53.8	N
16	17	171	62.2	8.9	48.8	3.2	770	46.6	N	55.8	N
17	18	175	51.7	3.7	42.1	3.2	1000	46.6	N	50.5	N
18	19	166	56.2	5.2	45	2.3	320	47.5	N	54.5	N
19	17	177	59.6	10.4	46	3.2	790	46.6	N	51.7	N
20	21	175	58.2	7.1	46.1	1.4	530	48.4	N	53.6	N
21	19	166	55.8	5.4	46.2	2.3	1070	47.5	N	53.2	N
22	21	177	54.2	7.0	46.2	1.4	1090	48.4	N	49.8	N
23	17	166	57.4	8.9	47.2	3.2	250	46.6	N	51	N
24	18	162	57.2	8.5	49	3.2	660	46.6	N	51.2	N
25	19	174	55.6	7.9	46.2	2.3	610	47.5	N	50.2	N
26	19	170	55.5	7.6	47.4	2.3	1070	47.5	N	50.4	N
27	21	169	55.2	8.4	45.6	2.3	1000	47.5	N	49.3	N
28	19	167	55.4	7.8	46.8	3.2	980	46.6	N	49.9	N
29	23	172	58	10.2	47	1.4	850	48.4	N	50.3	N
30	16	165	56.1	8.1	46.6	3.2	550	46.6	N	50.4	N
31	17	174	55.4	6.5	47.1	3.2	1020	46.6	N	51.4	N
32	19	168	55.8	5.1	46.8	3.2	280	46.6	N	53.2	N
Mean	19	169	56	7.2	45.1	2.6	780	47.2		51.2	
SD	1.8	4.7	2.9	1.8	2.6	0.7	260	0.7		2.3	