269 Nutritional assessment and dietary intake in children and teenagers with cystic fibrosis

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Introduction: Cystic Fibrosis (CF) is characterized by respiratory infections and malabsorption. The hypercatabolism inherent to CF, affects the nutritional requirements and, consequently, the nutritional status.
Objectives: Assess the nutritional status of patients with CF and compare the dietary intake with the nutritional state and requirements.
Methods: Cross-sectional observational study, 40 patients followed in a specialized CF center in Lisbon were included. A questionnaire was applied to the patient/care taker, which included a 48 h recall. Clinical and anthropometric parameters were recorded. The sample was divided in 5 groups: G1:7–12M; G2 1–3Y; G3: 4–8Y; G4: 9–13Y: G5: 14–18Y. Statistic analysis by SPSS v.20.0.
Results: 40 patients were evaluated; 51.2%female; average age of 9.4±5.0 Y. The diagnosis, was made in 25% between 6W and 6M and 25% between 1 and 5Y. No correlation was found between the age of diagnosis and the BMI z-score. A positive correlation was found in G1 and G2 between the energetic intake and BMI ($r = 1$, $p = 0.00$; $r = 0.835$, $p = 0.039$, respectively). The average pulmonary function (FEV1) was 88.9±22.9%; it was also found a positive correlation with BMI ($p = 0.00$). It was observed that 42.5% of the patients did supplementation and that the protein free powder was the most prescribed.
It was also observed that the patients with supplementation had lower pulmonary function and BMI ($p = 0.018$ e $p = 0.034$, respectively).
Conclusion: In conclusion the nutritional state, according to the z-score of BMI, is better on G3(4–8Y) and G5(14–18Y). However, only a small part of the sample reached the requirements in which G4(9–13Y) had the higher fulfillment percentage.

270 Body mass index percentiles in children with cystic fibrosis

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Introduction: In 2008 the Cystic Fibrosis Foundation (CFF) recommended children with CF over 2 years should have a BMI $\geqslant 50^{th}$ percentile due to its positive association with % predicted forced expiratory volume. However, UK 90 BMI charts define a healthy BMI range between the 9^{th} to 91^{st} centile for all children.
Objectives: To assess the BMI percentiles (BMIp) of children with CF based on the CFF and UK 90 classifications.
Methods: The weight (kg) and height (m) of 134 children with CF, aged 2–17 years, attending their annual review were recorded. BMIp were calculated as weight/height^2 (kg/m^2). Data were then analysed using BMI reference curves for the UK 90 charts.
Results: See the table. 54% of patients achieved a BMIp $\geqslant 50^{th}$ percentile. The UK 90 charts identified 79% of our CF patients as having a normal BMI (9^{th}–91^{st} centile).

Table: Great Ormond Street BMI data 2011

BMIp	UK 90 Classification	Boys % (n = 69)	Girls % (n = 65)	Total % (n = 134)
Over 91^{st}	Overweight	13 (9)	9 (6)	11 (15)
$50–91^{st}$	Normal	46 (32)	38 (25)	43 (57)
$9–50^{th}$	Normal	29 (20)	45 (29)	36 (49)
Under 9^{th}	Underweight	12 (8)	8 (5)	10 (13)
Mean		>50th	50th	50th

Conclusion: In our patient group, 46% of CF children had BMIp $<50^{th}$ centile and failed to achieve the CFF recommendation. Based on UK 90, only 10% were classified as underweight (BMIp $<9^{th}$ centile). It is well documented that children falling under the 9^{th} BMIp require intensive nutritional therapy. To date there is little evidence of the best strategy to treat children who fall between the 9th and 50^{th} BMIp. UK 90 charts classified 11% of our group as overweight. No data exists on the long term implications for children with CF who fall into this category.

271 Implications of transitioning from CDC to WHO growth charts on growth evaluation in young children with cystic fibrosis in the US

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Objectives: WHO growth charts are being used increasingly worldwide in the care of CF children, who are counseled to maintain weight-for-length percentile (WLP) $>50^{th}$ to promote better lung function. Because WHO's reference is taller and thinner than CDC's, we investigated how switching to WHO charts alters classification of "suboptimal" weight (WLP $<50^{th}$), the main nutritional status indicator used in most CF centers to make clinical care decisions.
Methods: We compared CDC and WHO charts in 1877 children age 0–24 months, born 2003–05, and reported in the 2008 US CF Foundation Registry.
Conclusion: Mean WHO-WLP (28^{th}) was above CDC-WLP (24^{th}) at age 0–6 mo ($p < 0.001$); this difference increased at age 6–24 mo (55^{th} vs 41^{st}, $p < 0.001$). Thus, the impact of switching to WHO charts on WLP classification increases with age at transition. Switching at age 6 mo had little impact but at 12 mo led to 15% (106/726) with CDC-WLP $<50^{th}$ to become $>50^{th}$ on WHO charts. This percentage increased to 33% at age 18 mo: 244 out of 733 with CDC-WLP $<50^{th}$ were $>50^{th}$ on WHO charts. In addition, this percentage varied depending on previous WLP: highest (43%) among those with optimal WLP during past 6 mo (CDC-WLP always $>50^{th}$), 28% among those with suboptimal WLP (CDC-WLP always $<50^{th}$), and lowest (10%) among those with intermediate WLP (CDC-WLP fluctuating between $>50^{th}$ and $<50^{th}$). These data show that ~25% of CF children exhibiting suboptimal weight based on CDC charts will appear to have optimal weight when switched to WHO charts. The clinical significance of this change is unclear until the association of WHO-WLP to lung disease outcomes is examined.
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272 Caloric intake in children and adolescents with cystic fibrosis

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Objective: To investigate the caloric intake in a large cohort of children and adolescents with CF, age 2–18 y, and compared this with the intake in healthy controls.
Methods: A total of 1726 completed 3-day dietary food records of 234 CF patients and 2860 completed two non-consecutive 24-hour dietary recalls of healthy peers were studied. Intake was expressed both as absolute caloric intake and as % of the gender- and age-specific estimated average requirement (EAR) in which recommendations were given for age groups. Caloric intake and % EAR were compared by using independent sample *t* tests.
Results: See the table.

Table: Caloric intake in CF girls and CF boys vs healthy controls

Age	Dutch	CF patients			Controls			p*
(years)	EAR caloric intake	Average age (SD)	Caloric intake/day (SD)	% EAR (SD)	Average age (SD)	Caloric intake/day (SD)	% EAR (SD)	
Girls								
1–3	1119	3.1 (0.4) (n = 67)	1419 (240)	127 (21)	3.0 (0.6) (n = 309)	1282 (292)	115 (26)	<0.00
4–8	1548	6.5 (0.9) (n = 93)	1848 (328)	119 (21)	6.3 (1.4) (n = 467)	1602 (383)	104 (25)	<0.00
9–13	2262	11.2 (0.8) (n = 81)	2265 (368)	100 (16)	11.6 (1.4) (n = 350)	2038 (406)	90 (18)	<0.00
14–18	2476	15.3 (0.6) (n = 42)	2480 (432)	100 (17)	16.0 (1.2) (n = 285)	2057 (494)	83 (20)	<0.00
Boys								
1–3	1190	3.1 (0.3) (n = 59)	1477 (281)	124 (24)	3.0 (0.6) (n = 317)	1379 (324)	116 (27)	0.03
4–8	1714	6.8 (1.0) (n = 102)	2017 (350)	118 (20)	6.2 (1.4) (n = 489)	1713 (392)	100 (23)	<0.00
9–13	2524	11.1 (0.9) (n = 102)	2422 (346)	96 (14)	11.5 (1.5) (n = 350)	2261 (520)	90 (21)	<0.00
14–18	3330	15.5 (0.7) (n = 59)	2956 (488)	89 (15)	16.0 (1.2) (n = 293)	2654 (819)	80 (25)	0.01

*Differences between caloric intake and % EAR in CF patients and healthy controls.

Conclusion: The absolute caloric intake in children and adolescents with CF was significantly higher than in controls. Patients with CF age 4 onwards often did not meet the commonly recommended 120% EAR.