

Habit-tic cough: Presentation and outcome with simple reassurance

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Abstract

Objectives: Our therapeutic approach to a habit/tic cough is simple reassurance in a single consultation. To quality assure our practice, we followed up children to determine outcomes at least 3 months after diagnosis.

Design: Consecutive children diagnosed over 6 years were studied. Medical records were analyzed retrospectively and parents answered a scripted verbal survey.

Results: Fifty-five patients were diagnosed (median age 9.9 years), with a median cough duration of 3 months (IQR 2-7.5 months, range up to 3 years). In 51/55 (93%) cases, cough was absent during sleep. 51/55 (93%) received prior medications with median 3 therapeutic trials, none of which resolved the cough. Follow-up was possible in 39/55 (71%) children after a median duration of 1.9 years. In 32/39 (82%), the cough had resolved completely (59% within 4 weeks, including 12% on the day), and it improved in 6/39 (15%). In the 26/39 (67%) parents who said they believed the diagnosis, there was 96% resolution of the cough, versus the 13/39 (33%) who were sceptical or disbelieving, when there was only 54% resolution. 7/39 (18%) children were later diagnosed with a tic disorder, functional symptoms, or a behavioural/psychiatric disorder.

Conclusions: Habit cough can be diagnosed from the characteristic history; the crucial question is whether the cough disappears during sleep. We have shown successful long term outcomes following a single consultation with simple reassurance, but it is important that the child and parents believe the explanation. It is not uncommon for subsequent tic disorders or behavioral issues to emerge.

KEYWORDS

cough, habit, psychogenic, tic

1 | INTRODUCTION

Childhood cough is extremely common and often a source of anxiety for parents, hence frequent visits to the GP. Although parental cough reporting may be inaccurate, community-based surveys suggest the prevalence of reported cough in children (without a cold) is about 30%.¹ There is a large differential diagnosis for chronic cough in children,¹ and sometimes the cough has no underlying pathological

cause, but is the result of a habit or tic. These children have often seen many doctors, been thoroughly investigated and received many medications. It is therefore important to consider this particular diagnosis, as a study of 62 children with habit cough who received no specific treatment found that the cough persisted for a mean of 6 years in a quarter of cases.² The British Thoracic Society (BTS) guidelines have outlined typical features of a habit cough (although they used the term psychogenic cough).¹

The American College of Chest Physicians (ACCP) 2006 guidelines³ highlighted the confusion over the various terms used, and their 2015 guideline suggests using the terms tic cough (rather than habit cough) and somatic cough syndrome (rather than psychogenic cough).⁴ The two categories are not the same, a tic is a repetitive stereotyped motor movement (eg, rapid blinking, neck twitches) or phonic production (eg, grunting, squeaks, words, or phrases), that involve discrete muscle groups and have certain core features.⁵ A habit/tic cough and throat clearing probably represent a combination of motor and phonic tics. A psychogenic cough is a somatization disorder referring to the “transfer of psychological distress into a physical disorder.”⁴

Due to the paucity of literature on long-term outcomes, and to quality assure our current practice, we aimed to survey the parents of children we had diagnosed with a habit cough to determine their outcomes after at least 3 months.

2 | METHODS

The setting was a tertiary paediatric respiratory center in London. Consecutive children diagnosed with a habit cough by a single specialist (IBL) over a 6 year period were studied. This included those seen in NHS and private practice. Diagnosis was based on typical history and normal examination (apart from demonstration of the distinctive cough); this was backed up by normal spirometric lung function; and further investigations, for example, a chest radiograph if necessary. The therapeutic approach was a full explanation and simple reassurance aimed at the patient in a single clinic appointment. Parents were asked to contact us if the cough did not resolve in which case a referral would be made to our respiratory physiotherapist or clinical psychologist, depending on circumstances.

Medical records (paper and electronic) were analyzed retrospectively. Parents were contacted as part of the service evaluation by telephone or email (at least 3 months after their appointment) to answer a scripted telephone survey. After a minimum of three unsuccessful attempts at contact over a 3-month period they were designated lost to follow-up.

Descriptive statistics are presented as percentages with median and interquartile range (IQR). Differences between groups were calculated using the Mann-Whitney *U* test for continuous data, and chi-squared for categorical data (logistic regression analysis was not performed as there were no significant associations found). Statistical analysis was performed using GraphPad Prism v6 for Windows (GraphPad Software, La Jolla, CA). A *P*-value of <0.05 was considered statistically significant. The study was registered with the Royal Brompton & Harefield NHS Foundation Trust clinical audit team as a service evaluation project; they concluded that formal Research Ethics Committee approval was not required. Permission to record the cough in patients was given verbally by the child/young person and parent at the time.

3 | RESULTS

There were 55 children diagnosed in 6 years; 38/55 (69%) were male. 9/54 (17%) children had a parent who smoked (data missing for one child). The majority 51/55 (93%) were private patients. Referrals were

made by GPs (51%), general paediatricians (26%), or self-referrals (18%); the rest were either existing patients or referred by an ENT specialist. Median age at diagnosis was 9.9 years (IQR 8.6-11.8 yrs, range 3.1-16.3 yrs), and the median duration of coughing was 3 months (IQR 2-7.5 months, range 1 week-3 yrs).

3.1 | Clinical features

The commonest clinical features are summarized in Table 1, and audio clips from six cases are available online. No child had a wet cough productive of sputum. Although the cough was most severe in the evening in 29/55 (54%), it disappeared completely as soon as the child was asleep in 51/55 (93%) cases. Four cases also coughed in their sleep, so their diagnosis at the time was “possible” habit cough; but they all had other factors that may have contributed to the night cough (asthma (*n* = 2), gastro-oesophageal reflux, and spasmodic croup), alongside their typical features of habit cough. In 23/55 (42%), the cough was disruptive in the classroom or had resulted in school absence.

No initial trigger for the cough was identifiable in 30/55 (55%) cases, but in 20/55 (36%) it had developed during a viral cold, and 7/55 (13%) coincided with an obvious psychosocial stressor (eg, new school, exams). No relieving factor was identified in 40/55 (73%) cases. In the remainder, the most common relieving factors were distraction (*n* = 4), going on holiday (*n* = 3), and taking sips of water (*n* = 3).

In 35/55 (64%) cases, there were no respiratory symptoms other than the cough. Commonest associated respiratory symptoms were chest pain (*n* = 8), and throat discomfort (*n* = 7); other symptoms reported occasionally included breathlessness, wheeze, and stridor. Three children had a combination of respiratory symptoms, and five reported symptoms suggestive of dysfunctional breathing. There were 28/55 (51%) children who had at least one associated symptom that was felt to be functional in nature, including 8/55 (15%) who had multiple functional symptoms (Table 2).

3.2 | Examination

Aside from the coughing, respiratory examination was normal in 100% of cases, although four children had an element of mild dysfunctional

TABLE 1 Commonest (present in ≥50% cases) clinical features in the 55 children

	<i>n</i>	%
Normal respiratory examination (including four with mild dysfunctional breathing)	55	100
Absent during sleep	51	93
Dry cough	45	82
Loud cough	37	67
Absence of other respiratory symptoms	35	64
Repetitive cough	34	62
Maximal severity in the evening	29	54
Associated functional symptoms	28	51

TABLE 2 Associated functional symptoms in the 55 children

	n	%
Other tic, for example, repetitive throat clearing, sniffing	12	22
Gastrointestinal—nausea, vomiting or retching, non-specific abdominal pain	11	20
Dysfunctional breathing pattern (reported)	5	9
“Panic attack” symptoms—palpitations, hyperventilation, paraesthesia	3	6
Poor appetite	3	6
Fatigue	3	6
Headache	2	4
Dizziness	1	2

breathing. Positive findings on systemic examination included mild cervical lymphadenopathy ($n = 10$) and pharyngeal erythema ($n = 2$).

Investigations prior to referral were carried out in 34/55 (62%) children (Table 3): 24/55 (44%) had a chest radiograph (normal in 92%); 13/55 (24%) had spirometry (always normal); 15/55 (27%) had allergy testing (40% had a positive result); 8/55 (15%) had out-patient nasendoscopy (the only abnormality was adenoidal hypertrophy in one child). We did a chest radiograph in an additional five children (total 29/55, 53%); and spirometry in an additional 30 children (total 43/55 78%).

Treatments prior to referral were given to 93% (51/55) children, with a median of 3 therapeutic trials each (IQR 2-4) (Figure 1, Table 4). In 41/55 (75%) cases, there was no improvement at all, and in those who improved there was never full resolution, not even temporarily.

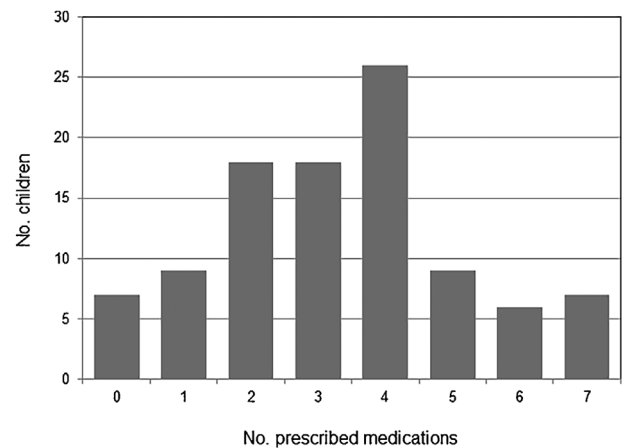
3.3 | Treatment initiated at referral

Aside from explanation and reassurance, 8/55 (15%) children were prescribed a course of oral antibiotics due to a moist element to their cough (although all other features were typical for habit cough). Three children were referred to a respiratory physiotherapist for instruction

TABLE 3 Investigations performed prior to referral in the 55 children

	n	%
Chest radiograph	24	44
Allergy testing (skin prick or specific IgE)	15	27
Respiratory secretions for viral PCR or bacterial culture	14	25
Spirometry	13	24
Blood tests—haematology and biochemistry	9	16
Nasendoscopy	8	15
Bronchodilator reversibility	5	9
Immunological testing	3	6
Reflux investigations—pH or impedance study	2	4

Number of investigations performed was 0 in 38% children (21/55); one in 16% (9/55); two in 11% (6/55); 3 in 13% (7/55); four in 11% (6/55); and five in 11% (6/55).

**FIGURE 1** Number of different medications prescribed prior to habit cough diagnosis

in breathing pattern control and relaxation exercises due to dysfunctional breathing; none were referred to a clinical psychologist.

3.4 | Follow-up

Follow-up data were obtained for 39/55 children (71%) after a median duration of 1.9 years (IQR 8 months-2.7 years, range 3 months-6.3 years). There were no significant differences in patient characteristics between those lost to follow-up and those contactable, in terms of age at assessment; gender; duration of cough; or certainty of the diagnosis.

In 32/39 (82%), the cough had resolved completely, in 6/39 (15%) it had improved and in just one patient the cough persisted. The one patient who did not improve at their 18 month follow-up had further investigations, under a different respiratory paediatrician in our department, that were all normal and habit cough was still believed to be the diagnosis. There was no statistical significant association between the child's gender, age at specialist review, or cough duration and likelihood of full cough resolution. Five parents could not remember the exact timing, but in 20/34 (59%) the cough went within 4 weeks, including 12% on the day and another 12% within one week. However, in 9/34 (26%) it took 1-6 months and in 4/34 (12%) over 6 months. In 21/39 (54%), there was no recurrence

TABLE 4 Treatments prescribed prior to referral in the 55 children

	n	%
Inhaled bronchodilator	42	76
Inhaled corticosteroid \pm long acting β_2 agonist	35	64
Oral antibiotic	31	56
Oral corticosteroid	18	33
Antihistamine	14	25
Montelukast	12	22
Nasal corticosteroid spray	11	20

Number of treatments given was 0 in 7% children (4/55); one in 9% (5/55); two in 18% (10/55); three in 18% (10/55); four in 26% (14/55); five in 9% (5/55); six in 6% (3/55); and seven in 7% (4/55).

of the cough, however 17/39 (44%) had further episodes which were mild and self-limiting. Recurrences were generally triggered by viral colds (53%) or stress (12%).

In 29/39 (74%) children, there were no further medical issues. However, 4/39 (10%) have had episodic respiratory symptoms (two of whom are known to have coexisting asthma); 4/39 (10%) developed a tic disorder or other functional symptoms, and 3/39 (8%) have been diagnosed with a behavioral or psychiatric disorder.

A total of 26/39 (67%) parents reported believing the diagnosis, and in those cases, 25/26 (96%) resolved completely; this compared with 13/39 (33%) parents who were sceptical or disbelieving, in which case only 7/13 (54%) children had resolution of their cough, $P = 0.003$. 4/39 (10%) parents were disappointed to be told that there was “nothing wrong” or were unhappy with the suggestion that the cough was “psychological.” 13/39 (33%) parents reported feeling reassured and relieved to be told by an expert that there was no serious underlying medical pathology. Parents had no difficulty remembering how they felt when given the diagnosis. Only 4/39 (10%) parents reported that they had suspected the diagnosis.

4 | DISCUSSION

Reviewing 55 children with a habit cough, we found that the cough was present for a considerable length of time; most had undergone multiple investigations; and almost all received a variety of medications that were continued despite not working. However, features were typical for a habit cough, particularly the absence of persistent nocturnal cough. Once diagnosed, a full explanation at a single consultation was successful in the majority of cases, especially if the parents believed the diagnosis (in which case 96% resolved). We did however find that almost a fifth of those followed up were subsequently diagnosed with a tic or behavioral/psychiatric disorder.

4.1 | Diagnosis

Habit cough can never be diagnosed if it is not even considered, despite the typical history. It is often regarded as diagnosis of exclusion, implying negative investigations, and unsuccessful therapeutic trials are needed. Unnecessary medication and over-investigation can be detrimental and increase anxiety, which may reinforce the cough.¹ Our diagnostic approach is consistent with the BTS guidelines, which recommend that “psychogenic cough” can be diagnosed using specific pointers from history-taking and clinical examination, accompanied by normal first line investigations (chest radiograph and spirometry).¹ Pointers include a loud, explosive cough that can be as frequent as every few seconds. Although the cough is said to be “honking” our experience is this sound is uncommon (only 6%). There is also said to be the classic “la belle indifférence,”¹ but we find the children are usually very concerned by the cough and its disrupting effect on their lives.

The other classic symptom is absence of cough when asleep, no matter how frequently they cough before bedtime. Absence refers to

absence of the loud persistent daytime cough; it does not mean complete absence of any cough at night, as the occasional cough can be normal, especially during viral colds. This was the case in 93% of the children reported at the initial consultation (similar to other series^{6,7}), and we would not make the diagnosis if the child persistently coughed throughout the night. When the parents thought the child might have a nocturnal cough they were asked to check that the child was truly asleep when coughing, rather than awake and coughing before falling asleep again. Nevertheless, a case report using a cough monitor found after treatment the child continued to cough overnight although much less frequently (50-90/h when awake vs 3/h when asleep).⁸ The ACCP guidelines caution against using lack of cough when asleep to diagnose psychogenic or habit cough, quoting evidence that cough from gastro-oesophageal reflux, and chronic bronchitis/emphysema can also be relieved by sleep.⁴ However, they referenced two small adult case series (9 and 10 patients) so this is not relevant.

4.2 | Treatment

A systematic review of management of psychogenic and habit-tic cough assessed 18 uncontrolled studies with 223 patients (96% were children and adolescents); they concluded that the quality of evidence was low and found a lack of evidence for conventional medications, apart from when the cough is part of a generalized tic disorder.⁷ There are a number of non-pharmacological strategies and the systematic review found that hypnosis (three series) resolved the cough in 78% cases, and suggestion therapy (four series) in 96% cases.⁷ A subsequent series of 85 children found 95% stopped coughing completely after 15 min of suggestion therapy; however, there was no follow-up, so long-term outcomes are unknown.⁹ Some authors have reported that suggestion therapy can be improved by a physical aid, or “distractor,” whereby the child is told this will soothe their airway irritation and alleviate the cough. Distractors include throat lozenges, sips of warm water, and in a small series nebulized lidocaine.¹⁰ The method with the greatest reported success is the “bed sheet technique” in which a sheet is wrapped tightly around the chest (and not removed until the coughing stops); this led to cough cessation in 31/33 children and the effect was sustained in 17/18 patients after a median of 14 months.¹¹

Our practice is to offer a clear (and often lengthy) explanation about the mechanism of the cough, reassurance about its benign nature, and a confident assurance that the cough will disappear. The conversation is directed toward the child, with the parents listening in, and takes place at a single consultation at the time of diagnosis. We have found this to be effective; 82% resolved totally and a further 15% had some improvement. Although cough recurrence was common during times of stress or viral colds, episodes were short-lived suggesting the children had the insight to control it. Three children required a respiratory physiotherapist to resolve dysfunctional breathing, but no one needed a clinical psychologist. It is important to stress to everyone that the child is not deliberately coughing to annoy the parents or teachers, and that they are not feigning illness. Despite this, four parents reported they were disappointed to be told that there was “nothing wrong”; or were unhappy with the suggestion

the cough was “psychological” (we did not explain it that way). It has been said the capacity of the caregiver to accept the habit cough diagnosis is an important factor for successful resolution,¹² and we agree. In parents who are resistant to the explanation, one must always consider whether there is secondary gain for them.

4.3 | Comorbidity

We found a high rate of psychological comorbidity; half the children had associated functional symptoms, with 15% having multiple symptoms. Furthermore, at follow-up, 10% had developed a tic disorder, and 8% been diagnosed with a behavioral or psychiatric disorder. Vocal tics, which can include “cough tics,” are common components of generalized tic disorders and Tourette's syndrome, so these must be considered. The prevalence of comorbid psychiatric disorders reported by other authors has been highly variable, ranging from 13% to 100%, which may reflect different thresholds for referral for psychological or psychiatric evaluation.^{13,14} The same stressors leading to a habit cough may cause other psychological manifestations and functional symptoms. The stressors are often not obvious, although we encourage parents to explore issues outside of the clinic, with the obvious ones being peer pressure at school, physical and cyber bullying, stress of exams, family relationships etc. The fact that the majority were private patients is interesting and one wonders about extra stresses in high achieving families. Finally, something that must be considered by the paediatrician is whether there may be serious safeguarding issues, possibly including child sexual abuse, particularly in the more extreme cases, and in those in whom symptoms do not easily resolve.

5 | CONCLUSIONS

Habit cough can be diagnosed clinically, mostly from the characteristic history and normal physical examination. The crucial question to ask, that is often overlooked, is whether the cough disappears when the child falls asleep, as this is highly suggestive of the diagnosis. Our series demonstrates successful long-term outcomes following a single consultation for diagnosis with simple reassurance, but it is particularly important that the child and parents believe the explanation.

CONFLICTS OF INTEREST

We declare that we have no conflict of interests.

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SUPPORTING INFORMATION

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