

Cow's Milk Protein Allergy Awareness and Practice Among Pediatricians in El Sharkia Governorate: A Questionnaire-Survey

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Abstract

Background: Cow's milk protein allergy (CMPA) is the most common food allergy in pediatrics, with prevalence ranging between 1.8% and 7.5% in the first year of life. CMPA usually develops during the first year of life, The present work aimed to assess cow's milk protein allergy knowledge among pediatricians. **Methods:** This cross-sectional study was conducted in El-Sharkia Governorate, Egypt . 256 pediatric physicians participate in this study(questionnaire-survey). Pediatricians were subjected to voluntary participation to answer the prepared questionnaire and no patient- specific information was collected. The questionnaire was applied via face-to-face method. The prepared questionnaire included two parts: The first part included questions about pediatricians themselves such as gender, age, subspeciality, scientific degree, years of experience, workplace and living place. The second one included questions about pediatricians's knowledge of cow milk protein allergy such as: Diagnostic symptoms and signs. Knowing Cow Milk Symptoms Score (CoMiSS score). **Results:** regarding gender, female were 129 (50.4%) and male were 127 (49.6%). Regarding Age group 40-50 were 82 (32%), 50-60 were 26 (10.2%), less than 40 years were 147 (57.4%) and more than 60 were 1 (0.4%). Regarding practice, both were 161 (62.9%) and government facility was 95 (37.1%). Most of pediatricians were general pediatricians (78.1%) This study showed that low level of knowledge about CMA among the studied group. **Conclusion:** Gaps still exist in the knowledge of pediatricians about CMPA.

Key words: cow's milk protein allergy- knowledge- pediatricians- Cow Milk Symptoms Score.

I. Introduction:

The World Allergy Organization definition for CMPA is "hypersensitivity reaction brought on by specific immunologic mechanisms to cow's milk"⁽¹⁾.

Cow's milk protein allergy (CMPA) is the most common food allergy in pediatrics, with prevalence ranging between 1.8% and 7.5% in the first year of life ⁽²⁾.

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CMPA usually develops during the first year of life, mainly because cow milk is frequently the first food protein to which children are exposed ⁽³⁾.

Food allergy is defined as an adverse health effect arising from a specific immune response that occurs reproducibly following exposure to a given food ⁽⁴⁾.

Exclusive breastfeeding decreases the incidence of CMPA compared with formula feeding or mixed feeding. Of exclusively breast-fed infants, only 0.5% show clinical reactions to CMP, and most of these are mild to moderate ⁽⁵⁾. This is caused by the low level of CMP in breast milk which is 100000 times less than that in cow's milk⁽⁶⁾.

CMPA should be differentiated from cow's milk intolerance where the former is an immune mediated reaction while the latter is usually due to lactase deficiency which is rare in infants except following gastrointestinal infections. It may be classified into three categories: a) immunoglobulin E(IgE)-mediated, with an immediate onset of symptoms after the intake; b) non-IgE-mediated, with a late onset of symptoms, or c) with mixed symptoms. Non-IgE-mediated CMPA is more difficult to diagnose because (1) symptoms occur hours to days after milk consumption; (2) symptoms usually involve gastrointestinal system and skin, which are very commonly involved in many other conditions; and (3) there is no specific laboratory test to confirm or exclude the diagnosis⁽⁷⁾.

Symptoms and signs related to CMPA have been suggested to involve many different organ systems, mostly the skin, the gastrointestinal system and the respiratory tract, including oral and perioral swelling, dysphagia, food impaction, vomiting, regurgitation, dyspepsia, early satiety, anorexia, food refusal, diarrhea, rectal bleeding, failure to thrive, abdominal pain, severe colic, and persistent constipation often with perianal abnormalities⁽⁸⁾.

Approximately 50% to 70% of subjects have cutaneous symptoms, 50% to 60% gastrointestinal symptoms and 20% to 30% respiratory symptoms ⁽⁹⁾.

CMPA is easily missed in primary care settings and needs to be considered as a cause of infant distress and diverse clinical symptoms ⁽¹⁾.

Missing cases of CMPA can result in continuous blood loss and unnecessary, ineffective treatment of eczema while overdiagnosis can lead to dietary deficiencies and difficulty in reintroducing eliminated food items. Hence, presence of sufficient awareness of the possibility for preventing CMPA as well as guidelines for diagnosis and management of the condition are important given the considerable burden placed by the symptomatic manifestation of CMPA on both the infant and their parents ⁽¹⁰⁾.

The present work aimed to assess cow's milk protein allergy knowledge among pediatricians.

II. Patients and Methods

This cross-sectional study was conducted in El-Sharkia Governorate, Egypt. 256 pediatric physicians participated in this study(questionnaire-survey).

Technical design:

a. Site of study:

This study was carried out in El Sharkia governorate.

b. Type of the study:

Descriptive cross-sectiona study.

Operational design:

1. Pediatricians were subjected to voluntary participation to answer the prepared questionnaire and no patient- specific information was collected.

2. The questionnaire was applied via face-to-face method.

3. The prepared questionnaire included two parts:

a) The first part included questions about pediatricians themselves such as gender, age, subspeciality, scientific degree, years of experience, workplace and living place.

b) The second one included questions about pediatricians'sknowlage of cow milk protein allergy such as:

- Knowing Cow Milk Symptoms Score (CoMiSS score).

Statistical analysis:

The data were coded, entered and processed on computer using *Statistical package for social science (SPSS)* (version24).The results were represented in tabular and diagrammatic forms then interpreted.

Mean, standard deviation, range, frequency, and percentage were use as descriptive statistics.

III. Results:

– **Table (1) and figures (1, 2, 3)** show that regarding gender, female were 129 (50.4%) and male were 127 (49.6%). Regarding Age group 40-50 were 82 (32%), 50-60 were 26 (10.2%), less than 40 years were 147 (57.4%) and more than 60 were 1 (0.4%). Regarding practice, both were 161 (62.9%) and government facility was 95 (37.1%).

– This table shows that regarding name of the city where you practice, abu-hammad were 19 (7.4%), abu-kabir were 15 (5.9%), Belbeis were 19 (7.4%), minya-elqamh were 16 (6.3%) and Zagazig were 80 (31.3%)(**Table 2**).

– This table shows that regarding two separate diseases with overlap of some symptoms that may confuse the diagnosis were 256 (100%)(**Table 3**).

– Regarding knowledge of Cow Milk Symptoms Score, percentage of no were 158 (61.7%) and yes were 98 (38.3%)(**Table 4**).

– Regarding First line formula in non-exclusively breast fed infant diagnosed by CMPA, Amino acid formula were 33 (12.9%), Extensively hydrolyzed formula were 92 (35.9%), Partially hydrolyzed formula were 81 (31.6%), Lactose free formula were 47 (18.4%) and Age appropriate standard formula were 3 (1.2%)(Table 5).

Table (1): demographic data among the studied group.

		No.	%
Gender	Female	129	50.4
	Male	127	49.6
Age group	40-50	82	32.0
	50-60	26	10.2
	less than 40 years	147	57.4
	more than 60	1	0.4
sub-specialty	gastroentrologist	8	3.2
	general pediatrician	200	78.1
	Immunologist	7	2.7
	Pulmonologist	10	3.9
	Other subspecialities	31	12.1
scientific degree	Lecturer	7	2.7
	Prof	12	4.7
	Resident	96	37.5
	Specialist	141	55.1
practice	Both	161	62.9
	government facility	95	37.1

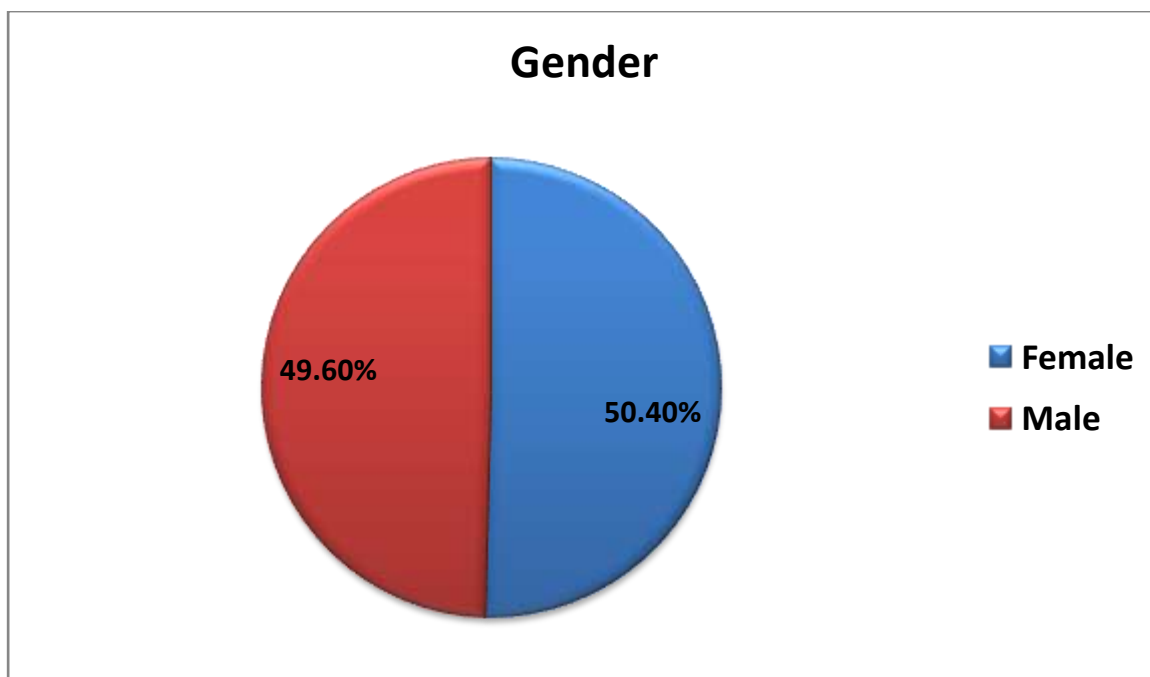


Figure (1): Gender among the studied group.

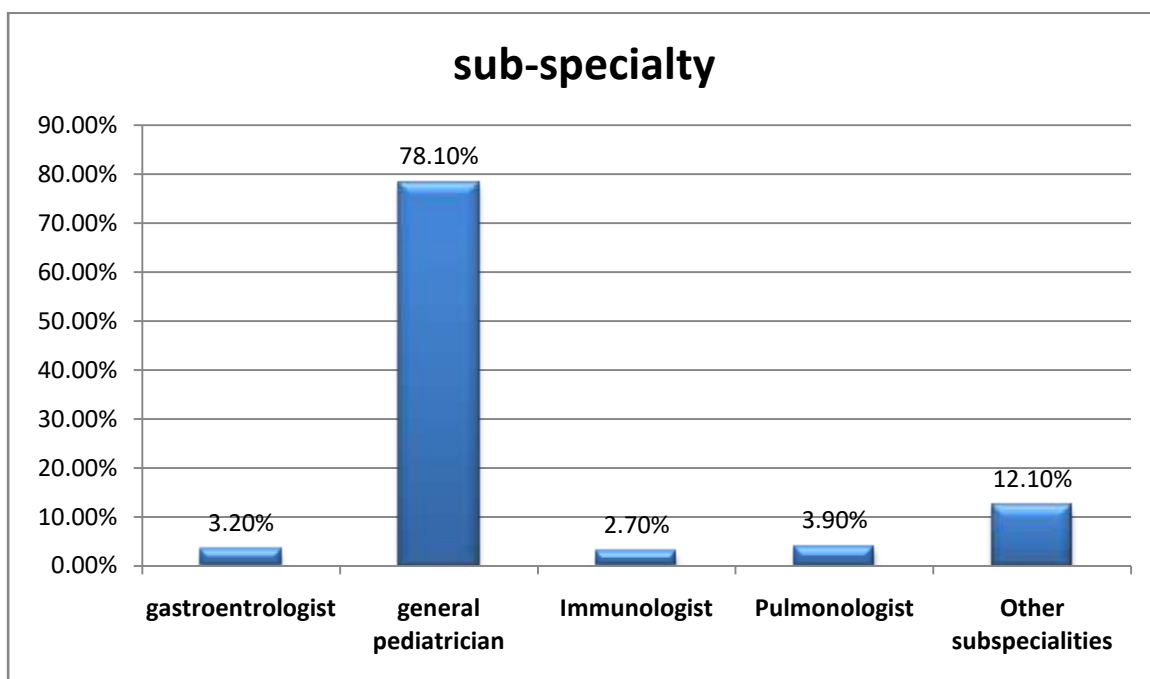


Figure (2): sub-specialtyamong the studied group.

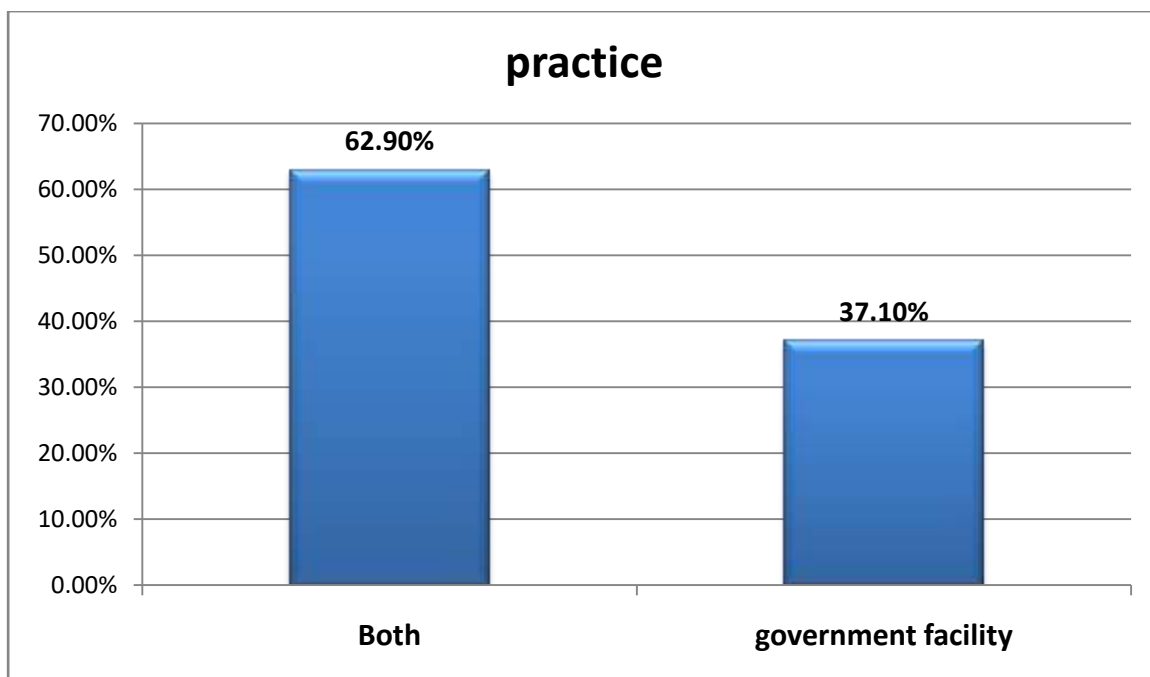


Figure (3): practice among the studied group.

Table (2): name of the city among the studied group.

		No.	%
name of the city where you practice	abu- hammad	19	7.4
	abu-kabir	15	5.9
	Belbeis	19	7.4
	el-huseiniya	19	7.4
	el-salhia	19	7.4
	Fakous	32	12.5
	Hehia	17	6.6
	kafr-saqr	20	7.8
	minya- elqamh	16	6.3

	Zagazig	80	31.3
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Table (3): From your clinical point of view about cow milk allergy and lactose intolerance, Are they two separate diseases with overlap of some symptoms that may confuse the diagnosis?

		No.	%
They are two separate diseases with overlap of some symptoms that may confuse the diagnosis	Yes	256	100.0

Table (4): knowledge of Cow Milk Symptoms Score among the studied group.

		No.	%
Cow Milk Symptoms Score	No	158	61.7
	Yes	98	38.3

Table (5): First line formula in non-exclusively breast fed infant diagnosed by cow milk protein allergy among the studied group.

		No.	%
First line formula in non-exclusively breast fed infant diagnosed by CMPA	Amino acid formula	33	12.9
	Extensively hydrolyzed formula	92	35.9
	Partially hydrolyzed formula	81	31.6
	Lactose free formula	47	18.4

	Age appropriate standard formula	3	1. 2
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IV. Discussion

This study showed that low level of knowledge about CMA among the studied group.

Gaps in the knowledge of pediatricians about CMA have been demonstrated previously in ⁽¹¹⁾.

Also **Gold et al.**, ⁽¹²⁾ found that lack of knowledge was associated in their studied group.

Guideline adherence has been discussed by many authors worldwide in the past decades. **Cabana et al.**, ⁽¹³⁾ identified a wide spectrum of barriers to guideline adherence such as lack of awareness, lack of familiarity, lack of agreement, lack of self-efficacy, lack of outcome expectancy, inertia of previous practice and external barriers that impact guideline implementation.

Intentional non-compliance may be motivated by valid reasons, mainly related to contraindications and patient preferences, they must be considered when developing a guideline ⁽¹⁴⁾, but lack of awareness seems to be an important barrier in our study. A large study conducted in the USA showed that only 55% of patients are cared for according to the recommendations described in guidelines ⁽¹⁵⁾.

The barriers to adherence may be related to health care professionals but also to patients, to the organizational context and the social and cultural context of the health care system ⁽¹⁶⁾.

This study showed that, First line formula in non-exclusively breast fed infant diagnosed by cow milk protein allergy among the studied group was extensively hydrolyzed formula followed by partially hydrolyzed formula. This study showed that, Formula recommendation for infants presenting with anaphylaxis among the studied group was extensively hydrolyzed formula followed by Amino acid formula. This study showed that, Formula recommended for infants with multiple food allergies among the studied group was Age appropriate standard formula followed by Amino acid formula. This study showed that, Formula recommended for infants with enterocolitis as the sole presenting symptoms among the studied group was Age appropriate standard formula and Amino acid formula. This study showed that, Formula recommended for infants with family history of sever allergy and no chance of exclusively breast feeding among the studied group was extensively hydrolyzed formula followed by Amino acid formula.

In **Faria et al.**, ⁽¹⁷⁾ study, approximately 80% of pediatricians recognized the extensively hydrolyzed formulas as an option for CMPA treatment.

58.2% of pediatricians would prescribe an extensively hydrolyzed formula obeying the guidelines ⁽¹⁸⁾.

Some suggestions from the literature consider the possibility of using amino acid formulas to diagnose CMPA more quickly ⁽¹⁹⁾.

Yüce et al., ⁽²⁰⁾ found AAF was the most commonly selected formula by pediatricians in a non-exclusively breast-fed infant with CMPA (48.8%), for infants presenting with anaphylaxis (58.8%), enterocolitis

(40.7%) or multiple food allergies (52.0%) and in at-risk infants with no chance of exclusive breastfeeding (40.2%).

Koletzko et al.,⁽⁸⁾ reported although practice patterns identified in this study indicated management of exclusively breast-fed infants with CMPA to be in accordance with European Society of Pediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) guidelines, inappropriate practice patterns were noted in the first-line treatment among infants not exclusively breast-fed. AAF was found to be the most commonly selected formula by pediatricians in a non-exclusively breast-fed infant with CMPA (48.8%), while eHF was selected in this group of infants only by 23.2% of pediatricians.

Although this seems in accordance with the statement that cow's milk-based formula and any complementary food containing CMP should be avoided for infants that are not exclusively breastfed, the first line treatment is expected to be extensively hydrolyzed formula (eHF) in this group⁽¹⁰⁾ in term of its lower cost and higher efficacy in inducing tolerance than), amino acid-based formula (AAF)⁽²¹⁾.

Use of partially hydrolyzed formula (pHF)] based on CMP or other mammalian protein as well as milk from other mammalian species are not recommended for infants with CMPA⁽¹⁰⁾.

This is due to inclusion of large peptides with immunogenicity in the molecule and low tolerability rates for pHF^(10, 22) and the risk of cross-reactivity and being not nutritionally adapted to the needs of the infant for other mammalian milks⁽²³⁾.

This seems in line agreement with reported indications of AAF including severe cases such as anaphylaxis, enteropathy, eosinophilic esophagitis and food protein induced enterocolitis along with cases of multiple system involvement, multiple food allergies and intolerance to eHF⁽¹⁰⁾.

While eHF and AAF remove allergenicity, in CMPA prevention the loss of immunogenicity also prevents the immune system from developing tolerance to milk proteins⁽²²⁾.

As a result, pHF is commonly used for prevention of allergy and when exclusive breastfeeding is impossible; all at-risk infants are recommended to receive a pHF for prevention of allergy until their risk has been assessed by a healthcare provider⁽²³⁾.

Although efficacy of using both pHF and eHF were shown for the prevention of allergy in infants at high risk of allergy⁽²⁴⁾, AAF is not recommended in prevention of CMPA.⁽¹⁰⁾

Hence, **Boyce et al.,**⁽⁴⁾ findings emphasize that practice patterns in use of formula-based therapy of infants with CPMA in clinical practice in Turkey should be improved in terms of compatibility with therapeutic indications specified for each formula.

Accordingly, earliest time to re-challenge with cow's milk after maintaining a therapeutic diet was identified to be 6 months by half of pediatricians in this study, while consideration of longer than 9-month intervals was more common among pediatric gastroenterologists. Considering differences in practice patterns with respect to sub-specialty types, both gastroenterologists and allergists/immunologists seem to be more aware of clinical manifestations and spectrum of presenting symptoms of CMPA as compared with general pediatricians who tended to underestimate diagnostic value of anaphylaxis, angioedema, dysphagia, reflux and vomiting.

Given the likelihood of these symptoms to mimic severe allergic reactions associated with primary atopy and functional gastrointestinal disorders ⁽²⁵⁾, our findings emphasize that differential diagnosis of CMPA should be more carefully considered by general pediatricians.

V. Conclusion:

Gaps still exist in the knowledge of pediatricians about CMPA.

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