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Letter to the editor

Commentary on: Pike et al. 2019 "Physical activity among children with asthma: Cross-sectional analysis in the UK millennium cohort"

Title:

Is asthma associated with physical inactivity in children?

Abstract:

It has been questioned whether asthma is limiting physical activity in children. Pike et al. studied the association between parent-reported asthma diagnosis and physical activity measured by accelerometer in 6497 children aged 7 years from the UK Millennium Cohort Study. They found no difference in activity levels in children with or without reported asthma. However, not all children with asthma have symptoms induced by exercise. It is possible that exercise-induced symptoms rather than asthma is associated with physical activity limitations in children, but little evidence exist on this association. Future studies need to investigate whether exercise-induced symptoms cause physical activity limitations in children independent of the underlying diagnosis. This knowledge will help us design personalized strategies to make children more active.

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24 **Main text**

25 To the editor,

26 Physical activity in childhood is important for health and prevention of noncommunicable
27 diseases, yet many children do not meet WHO's recommendation of 60 minutes of moderate-to-
28 vigorous physical activity (MVPA) daily. There is conflicting evidence on whether children with
29 asthma are less active than their healthy peers but it is important to clarify this association in
30 order to design physical activity promotion strategies. Previous studies have relied upon self-
31 reported data on physical activity and only few smaller studies measured physical activity
32 objectively. We read with great interest the study by Pike et al. [1] that focuses on the association
33 between parent-reported asthma diagnosis and physical activity measured by accelerometer in
34 6497 children aged 7 years from the UK Millennium Cohort Study. Only half of the children met
35 the recommendation of at least 60 minutes of MVPA per day. They found no difference in the
36 daily activity of children with or without parent reported asthma or current wheeze. Daily MVPA
37 also did not differ by severity of asthma symptoms or prescribed inhaled corticosteroids. They
38 conclude that asthma is not associated with inactivity.

39

40 The study by Pike et al. adds valuable and good-quality evidence on the association between
41 asthma and physical activity in children, but the authors did not provide information on asthma
42 symptoms triggered by exercise or results of exercise challenge testing. We believe this
43 information would be important when studying the association between asthma and physical
44 inactivity in children. Children with asthma who have symptoms triggered by exercise are more
45 likely to be inactive than children with asthma who do not have exercise-induced symptoms. This
46 was found in a Greek population-based study in 607 schoolchildren aged 10-12 years where they

47 investigated associations between a positive exercise challenge test (measured as a fall in Forced
48 Expiratory Volume in one second, FEV1, of at least 13% after exercise), physical activity, and
49 asthma. Of the 65 with asthma, 33 (51%) had exercise-induced bronchoconstriction [2]. They found
50 no difference in activity level in children with or without reported asthma, but a positive exercise
51 challenge test was more common in children who were inactive or moderately active than in
52 children who were highly active. Similarly, a Dutch study in 26 children aged 4-14 years with
53 asthma found that a positive exercise-challenge test was associated with less time spent in MVPA
54 than children with a negative exercise-challenge test.[3] This suggests that a positive exercise-
55 challenge test, more than asthma, might be associated with a lower level of physical activity in
56 children.
57
58 Exercise-induced symptoms typically include cough, dyspnoea, wheeze, dizziness, chest or throat
59 tightness. Children may have exercise-induced symptoms due to asthma, but also due to other
60 reasons such as inducible laryngeal obstruction, dysfunctional breathing, or insufficient fitness
61 level [4]. This adds further complexity to the association between asthma and physical activity. A
62 Swedish study in 1002 adolescents investigated the association between physical activity and self-
63 reported exercise-induced symptoms over a five-year period.[5] They showed that adolescents who
64 were more physically active at baseline (age 12 years) were more likely to report exercise-induced
65 symptoms at follow-up (age 17 years) after adjusting for potential confounders such as sex,
66 current asthma, weight, exercise-induced symptoms at baseline, and smoking at follow-up. This
67 suggests that children who are more physically active might be more likely to experience exercise-
68 induced symptoms later on, but no study has investigated if children with exercise-induced
69 symptoms become less physically active to avoid triggering respiratory symptoms.

Pike et al. conclude that reported asthma does not limit physical activity in children. However, it is important to clarify if exercise-induced respiratory symptoms cause physical activity limitation in children, independently of the underlying diagnosis. We need longitudinal clinical studies including both information on reported exercise-induced symptoms and clinical diagnosis to understand influences on physical activity over time, and we need qualitative studies to understand physical activity behaviours in children with respiratory symptoms. This knowledge would help design personalized strategies to increase physical activity in children.

References

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