Table C-11. Study characteristics of mattress cover studies

| Study | Intervention | Study Design | Demographic Factors | Clinical Factors |
| --- | --- | --- | --- | --- |
| Murray et al. 201718 | ***Arm 1:*** Impermeable covers (Astex Pristine) on mattresses, pillows, duvets  ***Arm 2:*** Placebo covers | ***Type of study:***RCT  ***Population:*** 284  ***Attrition:***15%  ***Age cohort:*** Mixed  ***Country:*** United Kingdom  ***Followup:*** 1 year | ***Age,***mean (SD):  Mattress covers: 7.11 (3.49)  Placebo: 7.45 (3.55)  Range: 3–17  ***% Male:*** 66%  ***Race:***  White: 64%  Asian: 25%  Other: 11%  ***Homeownership:*** NR  ***Geographic environment:***NR | ***HDM Sensitization***(skin prick test positive): 100%  ***Asthma severity***, % GINA step 1/2/3/4/5:  Mattress cover: 6.8% / 45.2% / 33.6% / 14.4%/ 0.0%  Placebo: 3.6% / 48.6% / 34.8% / 12.3% / 0.7%  ***Comorbidity:***  Hay fever:  Mattress cover: 35.7%  Placebo: 30.6%  Eczema:  Mattress cover: 40.7%  Placebo: 51.8%  ***Carpeted bedrooms:***NR  ***Cat/dog in home and sensitized:***  Mattress cover: 21.2%  Placebo: 21.0%  ***Smoker in home:***  Mattress cover: 45.9%  Placebo: 41.3% |
| Tsurikisawa et al. 201619 | ***Arm 1*:** Microfine covers on pillows and mattresses/futons  ***Arm 2:*** Vacuum with a nozzle designed to collect HDM on mattresses/futons  ***Arm 3:*** No intervention  Participants in the intervention groups were also given allergen avoidance instructions which included guidance on frequency and quality of vacuuming/cleaning/laundering, removal of bedroom carpets, and controlling humidity | ***Type of study:***RCT  ***Population*:** 111  Pillow/mattress covers: 50  Vacuum: 13  Control: 23  ***Attrition:***22.5%  ***Age cohort:*** Adult  ***Country:*** Japan  ***Followup:*** 1 year | ***Age,***mean (SD):  Pillow/mattress covers: 48.2 (13.4)  Vacuum: 53.1 (15.3)  Control: 48.9 (13.7)  ***% Male:***  Pillow/mattress covers: 34%  Vacuum: 23.1%  Control: 34.8%  ***Race:***Asian  ***Homeownership:*** NR  ***Geographic environment:***NR | ***HDM Sensitization,*** (serum IgE) mean (SE):  Pillow/mattress covers: 2.430 (0.549)  Vacuum: 2.366 (0.505)  Control: 2.421 (0.612)  ***Asthma severity:***  Step 1/2/3/4 severity of asthma (n/n/n/n per category):  Pillow/mattress covers: 2/15/17/16  Vacuum: 0/4/5/4  Control: 4/6/5/8  Daily dose of ICS (mg; converted to CFC-BDP equivalents):  Pillow/mattress covers: 1092.0 (757.2)  Vacuum: 1138.5 (727.5)  Control: 1055.1 (672.3)  FeNO, ppb, Mean (SD)  Pillow/mattress covers: 32.1 (18.1)  Vacuum: 36.0 (32.8)  Control: 33.9 (21.2)  PEF variability, mean (SD) % during 2-week baseline assessment:  Pillow/mattress covers: 12.4 (9.4)  Vacuum: 8.2 (4.0)  Control: 12.0 (9.0)  ***Duration of asthma*** (years [SD])  Pillow/mattress covers: 21.1 (16.0)  Vacuum: 19.5 (13.2)  Control: 17.7 (16.1)  ***Comorbidity:***  Atopic rhinitis  Pillow/mattress covers: 70%  Vacuum: 69.2%  Control: 69.6%  Atopic conjunctivitis  Pillow/mattress covers: 52%  Vacuum: 69.2%  Control: 56.5%  Atopic dermatitis  Pillow/mattress covers: 30%  Vacuum: 56.5%  Control: 26.1% |
| Tsurikisawa et al. 201320 | ***Arm 1:*** Microfine fiber covers (Microguard) on mattresses, futons, pillows + recommendations for routine cleaning of linens, furniture, and floors + recommendations to remove carpeting, pets, and stuffed/soft toys  ***Arm 2:*** No intervention or recommendations | ***Type of study:***RCT  ***Population:***25  ***Attrition:***0%  ***Age cohort:*** Adult  ***Country:*** Japan  ***Followup:*** 1 year | ***Age,***mean: 47 years  ***% Male:*** 36%  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization***(serum IgE): 100%  ***Asthma severity:***44% severe; 36% moderate; 20% mild persistent  ***Comorbidity:***  72% atopic rhinitis  68% atopic conjunctivitis  36% atopic dermatitis  ***Carpeted bedrooms:***NR  ***Cat/dog in home:***28% kept pet  ***Smoker in home:*** NR |
| Glasgow et al. 201121 | ***Arm 1:*** Feather-filled pillows and feather-filled quilt + impermeable cover on mattresses  ***Arm 2:*** Impermeable covers on mattress, pillows, quilts | ***Type of study:***RCT  ***Population:***197  ***Attrition:***4%  ***Age cohort:*** Mixed  ***Country:*** Australia  ***Followup:*** 1 year | ***Age,***mean: 10 years  Range: 7 to 14  ***% Male:*** 65%  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization***(skin prick test positive): 100%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:***NR  ***Cat/dog in home:***NR, but patients were excluded from study if allergic to cat while keeping pet  ***Smoker in home:***28% |
| Nambu et al. 200822 | ***Arm 1:*** Impermeable pillow (Yamasei; the pillow is designed to be house dust mite-impermeable without an additional cover)  ***Arm 2:*** Placebo pillow | ***Type of study:***RCT  ***Population:***20  ***Attrition:***0%  ***Age cohort:*** Child  ***Country:*** Japan  ***Followup:*** 1 year | ***Age,***median: 7 vs. 6 years  Range: 4 to 11  ***% Male:*** 80%  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization***(serum IgE): 100%  ***Asthma severity:***NR  ***Comorbidity:***  20% dermatitis  15% rhinitis  ***Carpeted bedrooms:***NR  ***Cat/dog in home:***NR  ***Smoker in home:***NR |
| de Vries et al. 200723  and  van den Bemt et al. 200724 | ***Arm 1:*** Non-polyurethane impermeable covers (Cara C’air) on mattresses, pillows, duvets  ***Arm 2:*** Placebo covers | ***Type of study:***RCT  ***Population:***126  ***Attrition:***17%  ***Age cohort:*** Adult  ***Country:*** Netherlands  ***Followup:*** 2 years | ***Age,***mean: 42 years  Range of eligible patients: 16 to 60  ***% Male:*** 58%  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization*** (serum IgE):100%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:***NR  ***Cat/dog in home:*** NR, but patients were excluded from study if allergic to cat or dog while keeping pet  ***Smoker in home:*** 7% of patients were current smokers |
| Dharmage et al. 200625 | ***Arm 1:*** Impermeable covers on mattresses, pillows, doonas  ***Arm 2:*** Placebo cotton covers | ***Type of study:***RCT  ***Population:***32  ***Attrition:***6%  ***Age cohort:*** Adult  ***Country:*** Australia  ***Followup:*** 6 months | ***Age****,* mean:  Intervention: 30 years  Control: 33 years  Range: 18 to 47  ***% Male:*** 37%  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization***(skin prick test positive): 100%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:*** 75%  ***Cat/dog in home:*** 23% had cats  ***Smoker in home:***NR, but current smokers not eligible for enrollment |
| van den Bemt et al. 200426 | ***Arm 1:*** Non-polyurethane impermeable covers on mattresses, pillows, duvets  ***Arm 2:*** Placebo covers | ***Type of study:***RCT  ***Population:***52  ***Attrition:***0%  ***Age cohort:*** Adult  ***Country:*** Netherlands  ***Followup:*** 9 weeks | ***Age,***mean: 34 years  Range of eligible patients: 12 to 60  ***% Male:*** 52%  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization:***(serum IgE): 100%  ***Asthma severity:***NR, but mean symptom score was 2.1 on a scale of 0 to 60  ***Comorbidity:***NR  ***Carpeted bedrooms:***NR  ***Cat/dog in home:*** NR, but patients were excluded from study if allergic to cat or dog while keeping pet  ***Smoker in home:*** 21% of patients were current smokers |
| Halken et al. 200327 | ***Arm 1:*** Semi-permeable polyurethane covers (Allergy Control) on mattresses, pillows  ***Arm 2:*** Placebo cotton covers | ***Type of study:***RCT  ***Population:***60  ***Attrition:***17%  ***Age cohort:*** Mixed  ***Country:*** Denmark  ***Followup:*** 1 year | ***Age,***mean: NR  Range of eligible patients: 5 to 15  ***% Male:*** NR  ***Race*** NR***:***  ***Geographic environment:***NR | ***HDM Sensitization*** (skin prick test positive): 100%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:*** NR  ***Cat/dog in home:***NR, but patients were excluded from study if allergic to cat or dog while keeping pet  ***Smoker in home:***NR |
| Lee 200328 | ***Arm 1:*** Cotton bed covers boiled for 10 minutes every 2 weeks, and exposed to sunlight for more than 3 hours every 2 weeks  ***Arm 2:*** No intervention | ***Type of study:***RCT  ***Population:***42  ***Attrition:***NR  ***Age cohort:*** NR  **Country*:*** Korea  ***Followup:*** 4 weeks | ***Age,*** mean: 43% <30 years  ***% Male:*** 55%  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization***(skin prick test positive): 100%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:***NR  ***Cat/dog in home:***36%  ***Smoker in home:***NR |
| Luczynska et al. 200329 | ***Arm 1:*** Microfiber impermeable covers (Allerguard) on mattresses, pillows, duvets  ***Arm 2:*** Placebo covers | ***Type of study:***RCT  ***Population:***55  ***Attrition:***18%  ***Age cohort:*** Adult  ***Country:*** United Kingdom  ***Followup:*** 1 year | ***Age,*** mean: 36 years  Range of eligible patients: 18 to 54  ***% Male:*** 49%  ***Race:***NR  ***Geographic environment:***Urban | ***HDM Sensitization*** (serum IgE):100%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:***NR  ***Cat/dog in home:*** NR, but patients were excluded from study if allergic to cat or dog while keeping pet  ***Smoker in home:*** NR |
| Woodcock et al. 200330 | ***Arm 1:*** Impermeable covers (Allergy Control Products) on mattresses, pillows, quilt covers  ***Arm 2***: Placebo polyester-cotton covers | ***Type of study:***RCT  ***Population:*** 1,122  ***Attrition:***16%  ***Age cohort:*** Adult  ***Country:*** United Kingdom  ***Followup:*** 1 year | ***Age,*** mean: 37 years  Range of eligible patients: 18 to 50  ***% Male:*** 36%  ***Race:*** 98% White  ***Geographic environment:***NR | ***HDM Sensitization*** (serum IgE):65%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:*** NR  ***Cat/dog in home:*** 55%  ***Smoker in home:*** 23% |
| Rijssenbeek-Nouwens et al. 200231 | ***Arm 1:*** Impermeable covers (Cara C’air) on mattresses, pillows, bedding  ***Arm 2***: Placebo covers | ***Type of study:***RCT  ***Population:***30  ***Attrition:***21%  ***Age cohort:*** Adult (but 2 patients were 11 years old)  ***Country:*** Netherlands  ***Followup:*** 1 year | ***Age,***mean: 29 years  Range: 11 to 51  ***% Male:*** 57%  ***Race:***NR  ***Geographic environment:*** NR | ***HDM Sensitization*** (skin prick test positive or serum IgE):100%  ***Asthma severity:***All patients moderate or severe  ***Comorbidity:***67% rhinitis  ***Carpeted bedrooms:***Patients with carpeted bedrooms were excluded from the study  ***Cat/dog in home:*** NR, but patients were excluded from study if allergic to cat or dog while keeping pet  ***Smoker in home:*** Smokers were excluded from the study |
| Sheikh et al. 200232 | ***Arm 1:*** Impermeable covers (Allerayde) on mattresses, pillows, duvets  ***Arm 2:*** Placebo covers | ***Type of study:***RCT  ***Population:*** 47  ***Attrition:***8%  ***Age cohort:*** Mixed  ***Country:*** United Kingdom  ***Followup:*** 1 year | ***Age,*** mean: 11 years  Range of eligible patients: 5 to 14  ***% Male:*** 62%  ***Race:***NR  ***Geographic environment:*** NR | ***HDM Sensitization*** (skin prick test positive):100%  ***Asthma severity:***NR  ***Comorbidity:*** NR  ***Carpeted bedrooms:*** NR  ***Cat/dog in home:*** Pet owners were excluded from study  ***Smoker in home:*** NR |
| Frederick et al. 199733 | ***Arm 1:*** Impermeable covers (Intervent) on mattresses, pillows, duvets  ***Arm 2:*** Placebo polycotton covers | ***Type of study:***RCT, crossover: intervention for 3 months, then 1 month wash-out period, then groups switched for 3 months  ***Population:*** 31  ***Attrition:***NR  ***Age cohort:*** Mixed  ***Country:*** United Kingdom  ***Followup:*** 1 year | ***Age,*** mean: 9 years  Range: 5 to 15  ***% Male:*** 65%  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization*** (skin prick test positive or serum IgE): 100%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:***NR  ***Cat/dog in home:***23%  ***Smoker in home:***NR |
| Burr et al. 198034 | ***Arm 1:*** Impermeable plastic covers on mattresses + provision of new bedding and pillow  ***Arm 2:*** No intervention | ***Type of study:***RCT, crossover: intervention for 1 month, then groups switched for 1 month  ***Population:*** 21  ***Attrition:***0%  ***Age cohort:*** Mixed  ***Country:*** United Kingdom  ***Followup:*** NR | ***Age,*** mean: NR  ***% Male:*** NR  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization*** (skin prick test positive):100%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:***NR  ***Cat/dog in home:***NR  ***Smoker in home:***NR |
| Burr et al. 197635 | ***Arm 1:*** Impermeable plastic covers on mattresses  ***Arm 2:*** Vacuuming of upholstered furniture + recommendation to vacuum carpet regularly | ***Type of study:***RCT, crossover: intervention for 6 weeks, then groups switched for 6 weeks  ***Population:***32  ***Attrition:***NR%  ***Age cohort:*** Adult  ***Country:*** United Kingdom  ***Followup:*** NR | ***Age,*** mean: 33  ***% Male:*** 56%  ***Race:***NR  ***Geographic environment:***NR | ***HDM Sensitization*** (skin prick test positive):100%  ***Asthma severity:***NR  ***Comorbidity:***NR  ***Carpeted bedrooms:*** NR  ***Cat/dog in home:***NR  ***Smoker in home:***NR |

CFC-BDP=chlorofluorocarbon-propelled beclomethasone dipropionate; Der f 1=*Dermatophagoides farina* house dust mite allergen; Der p 1=*Dermatophagoides* *pteronyssinus* house dust mite allergen; FeNO=fraction exhaled nitric oxide; GINA=Global Initiative for Asthma; HDM=house dust mite; IgE= immunoglobulin E; NR=not reported; PEF=peak exploratory flow; PPB=parts per billion; RCT=randomized controlled trial; SD=standard deviation; SE=standard error