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 interventionParticipants 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*:** 111Pillow/mattress covers: 50Vacuum: 13Control: 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: 2/15/17/16Vacuum: 0/4/5/4Control: 4/6/5/8Daily 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 rhinitisPillow/mattress covers: 70%Vacuum: 69.2%Control: 69.6%Atopic conjunctivitis Pillow/mattress covers: 52%Vacuum: 69.2%Control: 56.5%Atopic dermatitisPillow/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 rhinitis68% atopic conjunctivitis36% 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 yearsRange: 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 yearsRange: 4 to 11***% Male:*** 80%***Race:***NR***Geographic environment:***NR | ***HDM Sensitization***(serum IgE): 100%***Asthma severity:***NR***Comorbidity:***20% dermatitis15% rhinitis***Carpeted bedrooms:***NR***Cat/dog in home:***NR***Smoker in home:***NR |
| de Vries et al. 200723andvan 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 yearsRange 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 yearsRange: 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 yearsRange 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: NRRange 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 yearsRange 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 yearsRange 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 yearsRange: 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 yearsRange 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 yearsRange: 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