Influenza Vaccination in Children Having Chemotherapy for Cancer

- **Background**
  Children having chemotherapy for cancer are prone to developing influenza infections. Influenza virus infection may lead to hospitalisation/ prolonged hospitalisation, interruption of treatment and other severe adverse outcomes such as death. While clinical guidelines recommend children that are being treated for cancer be vaccinated against influenza, evidence supporting this recommendation is unclear.

- **Objective/s**
  The objectives of this review were to: (1) assess the efficacy of influenza vaccination in stimulating immunological response in children with cancer receiving chemotherapy, compared to other control groups; (2) assess the efficacy of influenza vaccination in preventing influenza infection; and (3) establish any adverse effects associated with influenza vaccines in children with cancer.

- **Intervention/Methods**
  The review included seven clinical controlled trials (CCT) and one randomised controlled trial (RCT). In total, 708 participants aged below 18 years were included in the review. The mean age of participants in the chemotherapy groups and other control groups were comparable.

  - None of the included studies compared influenza vaccine to placebo or assessed any clinical outcomes. That is, influenza infection, hospitalisation and delay in chemotherapy were not reported as outcome measures in any of the included studies.
  - Five of these studies compared responses to influenza vaccines in children receiving chemotherapy for cancer, to those with cancer but not receiving chemotherapy.
  - Four of these studies compared influenza vaccines in children receiving chemotherapy for cancer, to healthy children and those with asthma.

In five studies, loss to follow up was identified as a potential risk of bias. The only included RCT did not report the method of randomisation, clear allocation concealment or blinding. Attempts in gaining further information from trialists were made and were unsuccessful.

- **Results**
  No meta-analysis was conducted due to the lack of RCTs. The review reported that influenza vaccines were safe to use without major adverse effects in this population, and immunological responses were observed in all included studies. Two studies reported adverse effects including mild local reactions and low-grade fever. None of the studies reported more severe or
higher number of adverse effects in participants receiving chemotherapy compared to other control groups. Poorer immunological responses were observed in children receiving chemotherapy for cancer (four-fold rise of 25% to 52%) than those who were healthy (71% to 89%) / with asthma (63% to 77%) / children with cancer who did not receive chemotherapy over the last four weeks prior to vaccination (50% to 86%). However, no studies have compared vaccine to placebo, nor did they report any clinical outcomes. Concerning the use of different protocols, only one study compared two vaccination protocols in children with Acute Lymphoblastic leukaemia (ALL) on chemotherapy. No significant difference was found.

- **Conclusions**
The review reported the efficacy of influenza vaccination in stimulating immunological responses in children receiving chemotherapy for cancer. However, the lack of RCTs and studies investigating clinical outcomes make it impossible to assess the clinical benefits of influenza vaccinations in this patient group.

- **Implications for Practice**
Before further evidence is developed, clinicians need to consider the benefits and risks of influenza vaccination in children.

- **Reference**

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