Newcastle-Ottawa quality assessment scale (NOS)

Study 1

Selection

- Is the case definition adequate?
  a) Yes, with independent validation. *1 score*
- Representativeness of the cases
  a) Consecutive or obviously representative series of cases. *
- Selection of Controls
  a) Community controls. *1 score*
- Definition of Controls
  a) No history of disease (endpoint). *1 score*

2. **Comparability**

- Comparability of cases and controls on the basis of design or analysis
  a) Study controls for lymph node involvement, tumor grade. * b) Study controls for additional factors (e.g., age, HPV status). *

3. **Exposure**

- Ascertainment of exposure
  a) Secure record (e.g., surgical records). *1 score*
- Same method of ascertainment for cases and controls
  a) Yes. *1 score*
- Non-Response rate
  a) Same rate for both groups. *1 score*

Study 2

1. **Selection**

- Is the case definition adequate?
  a) Yes, with independent validation. *1 score*
- Representativeness of the cases
  a) Consecutive or obviously representative series of cases. *
- Selection of Controls
  a) Community controls. *1 score*
- Definition of Controls
  a) No history of disease (endpoint). *1 score*

2. **Comparability**

- Comparability of cases and controls on the basis of design or analysis
  a) Study controls for lymph node involvement, tumor grade. *

- b) Study controls for additional factors (e.g., age, sex). *

3. **Exposure**

- Ascertainment of exposure
  a) Secure record (e.g., surgical records). *1 score*
- Same method of ascertainment for cases and controls
  a) Yes. *1 score*
- Non-Response rate
  a) Same rate for both groups. *1 score*

Study 3

1. **Selection**

- Is the case definition adequate?
  a) Yes, with independent validation. *1 score*
- Representativeness of the cases
  a) Consecutive or obviously representative series of cases. *
- Selection of Controls
  a) Community controls. *1 score*
- Definition of Controls
  a) No history of disease (endpoint). *1 score*

2. **Comparability**

- Comparability of cases and controls on the basis of design or analysis
  a) Study controls for lymph node involvement, tumor grade. * b) Study controls for additional factors (e.g., TNM stage). *

3. **Exposure**

- Ascertainment of exposure
  a) Secure record (e.g., surgical records). *1 score*
- Same method of ascertainment for cases and controls
  a) Yes. *1 score*
- Non-Response rate
  a) Same rate for both groups. *1 score*

Study 4

1. **Selection**

- Is the case definition adequate?
  a) Yes, with independent validation. *1 score*

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- Representativeness of the cases
  a) Consecutive or obviously representative series of cases. *
- Selection of Controls
  a) Community controls. *1 score*
- Definition of Controls
  a) No history of disease (endpoint). *1 score*

2. **Comparability**

- Comparability of cases and controls on the basis of design or analysis
  a) Study controls for lymph node involvement, tumor grade. * b) Study controls for additional factors. *

3. **Exposure**

- Ascertainment of exposure
  a) Secure record (e.g., surgical records). *1 score*
- Same method of ascertainment for cases and controls
  a) Yes. *1 score*
- Non-Response rate
  a) Same rate for both groups. *1 score*

Study 5

1. **Selection**

- Is the case definition adequate?
  a) Yes, with independent validation. *1 score*
- Representativeness of the cases
  a) Consecutive or obviously representative series of cases. *
- Selection of Controls
  a) Community controls. *1 score*
- Definition of Controls
  a) No history of disease (endpoint). *1 score*

2. **Comparability**

- Comparability of cases and controls on the basis of design or analysis
  a) Study controls for lymph node involvement, tumor grade. * b) Study controls for additional factors (e.g., patient-specific factors). *

3. **Exposure**

- Ascertainment of exposure
  a) Secure record (e.g., surgical records). *1 score*

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- Same method of ascertainment for cases and controls
  a) Yes. *1 score*
- Non-Response rate
  a) Same rate for both groups. *1 score*

Study 6

1. **Selection**
   - Is the case definition adequate?
     a) Yes, with independent validation. *1 score*
   - Representativeness of the cases
     a) Consecutive or obviously representative series of cases. *
   - Selection of Controls
     a) Community controls. *1 score*
   - Definition of Controls
     a) No history of disease (endpoint). *1 score*
2. **Comparability**
   - Comparability of cases and controls on the basis of design or analysis
     a) Study controls for lymph node involvement, tumor grade. * b) Study controls for additional factors (e.g., matched patient design). *
3. **Exposure**
   - Ascertainment of exposure
     a) Secure record (e.g., surgical records). *1 score*
   - Same method of ascertainment for cases and controls
     a) Yes. *1 score*
   - Non-Response rate
     a) Same rate for both groups. *1 score*

Study 7

Selection

- Is the case definition adequate?
  a) Yes, with independent validation. *1 score*
- Representativeness of the cases
  a) Consecutive or obviously representative series of cases. *
- Selection of Controls
  a) Community controls. *1 score*
- Definition of Controls
  a) No history of disease (endpoint). *1 score*

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2. **Comparability**
    - Comparability of cases and controls on the basis of design or analysis
      a) Study controls for lymph node involvement, tumor grade. * b) Study controls for additional factors (e.g., HPV status). *
3. **Exposure**
    - Ascertainment of exposure
      a) Secure record (e.g., surgical records). *1 score*
    - Same method of ascertainment for cases and controls
      a) Yes. *1 score*
    - Non-Response rate
      a) Same rate for both groups. *1 score*

Study 8

Selection (Maximum 4 Stars):

1. **Representativeness of the Exposed Cohort**: ★★
    - The study includes a large and diverse cohort of HPV+ oropharyngeal squamous cell carcinoma (OPSCC) patients. This represents a well-defined patient population.
2. **Selection of the Non-Exposed Cohort**: ★★
    - The study compares patients with high versus low intratumoral CD103+ immune cell abundance, allowing a comparison within the same patient population based on immune cell profiles.
3. **Ascertainment of Exposure**: ★★
    - CD103+ cell abundance was measured using immunohistochemistry, a validated and standardized method.
4. **Demonstration That Outcome of Interest Was Not Present at Start of Study**: ★
    - The study focuses on the abundance of CD103+ immune cells at diagnosis before treatment, ensuring that the outcome (survival) is not influenced by prior treatments.

Total Selection Score: 4/4 Stars

Comparability (Maximum 2 Stars):

1. **Comparability of Cohorts on the Basis of the Design or Analysis**: ★★
    - The study controls for significant confounders such as stage, age, and smoking status using multivariable analysis, making the comparisons reliable.

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Total Comparability Score: 2/2 Stars

Outcome (Maximum 3 Stars):

1. **Assessment of Outcome**: ★★
    - Overall survival (OS) and progression-free survival (PFS) were measured using consistent statistical methods such as Kaplan-Meier analysis and multivariable Cox proportional hazard models.
2. **Was Follow-Up Long Enough for Outcomes to Occur?**: ★
    - The study had a median follow-up period of over 5 years, which is sufficient to observe survival outcomes in this patient population.
3. **Adequacy of Follow-Up of Cohorts**: ★
    - The study followed patients through the treatment period, although being retrospective may pose a limitation in long-term consistency.

Total Outcome Score: 3/3 Stars

Total NOS Score:

- **Selection**: 4/4
- **Comparability**: 2/2
- **Outcome**: 3/3
- **Overall NOS Score**: **9/9 Stars**

Study 9

1. **Selection**
    - Is the case definition adequate?
      a) Yes, with independent validation. *1 score*
    - Representativeness of the cases
      a) Consecutive or obviously representative series of cases. *
    - Selection of Controls
      a) Community controls. *1 score*
    - Definition of Controls
      a) No history of disease (endpoint). *1 score*
2. **Comparability**
    - Comparability of cases and controls on the basis of design or analysis
      a) Study controls for lymph node involvement, tumor grade. * b) Study controls for additional factors (e.g., tumor grade, age). *

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3. **Exposure**
    - Ascertainment of exposure
      a) Secure record (e.g., surgical records). *1 score*
    - Same method of ascertainment for cases and controls
      a) Yes. *1 score*
    - Non-Response rate
      a) Same rate for both groups. *1 score*

Study 10

1. **Selection**
    - Is the case definition adequate?
      a) Yes, with independent validation. *1 score*
    - Representativeness of the cases
      a) Consecutive or obviously representative series of cases. *
    - Selection of Controls
      a) Community controls. *1 score*
    - Definition of Controls
      a) No history of disease (endpoint). *1 score*
2. **Comparability**
    - Comparability of cases and controls on the basis of design or analysis
      a) Study controls for lymph node involvement, tumor grade. * b) Study controls for additional factors (e.g., HPV status, tumor stage). *
3. **Exposure**
    - Ascertainment of exposure
      a) Secure record (e.g., surgical records). *1 score*
    - Same method of ascertainment for cases and controls
      a) Yes. *1 score*
    - Non-Response rate
      a) Same rate for both groups. *1 score*

Study 11;

Selection (Maximum 4 Stars):

1. **Representativeness of the Exposed Cohort**: ★
    - The study uses data from The Cancer Genome Atlas (TCGA) and the Fred Hutchinson Cancer Research Center's Oralchip study, providing a representative sample of OSCC patients.

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2. **Selection of the Non-Exposed Cohort**: ★
    - The study compares immune cell composition in HPV-positive and HPV-negative OSCC patients.
3. **Ascertainment of Exposure**: ★
    - Exposure to immune phenotypes is determined through CIBERSORT analysis of gene expression profiles, a validated computational method.
4. **Demonstration That Outcome of Interest Was Not Present at Start of Study**: ★
    - The study focuses on immune cell abundance before survival outcomes, ensuring initial independence.

Total Selection Score: 4/4 Stars

Comparability (Maximum 2 Stars):

1. **Comparability of Cohorts on the Basis of the Design or Analysis**: ★★
    - The study controls for key confounders like age, HPV status, tumor stage, and smoking history through multivariable Cox regression.

Total Comparability Score: 2/2 Stars

Outcome (Maximum 3 Stars):

1. **Assessment of Outcome**: ★
    - The study uses multivariable Cox regression analysis for survival, focusing on overall survival (OS) as the primary outcome.
2. **Was Follow-Up Long Enough for Outcomes to Occur?**: ★★
    - The follow-up period spans up to 5,480 days (approx. 15 years), which is sufficient for observing survival outcomes in OSCC patients.
3. **Adequacy of Follow-Up of Cohorts**: ★
    - The study reports follow-up information for most patients, but some data (e.g., smoking history) is missing for a subset.

Total Outcome Score: 3/3 Stars

Total NOS Score:

- **Selection**: 4/4
- **Comparability**: 2/2
- **Outcome**: 3/3
- **Overall NOS Score**: **9/9 Stars**

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Author	Study	Selection (4 Stars)	Comparability (2 Stars)	Outcome (3 Stars)	Total NOS Score
Muijlwijk, 2024 (38)	Study 1	4	2	3	9/9
Oliveira, 2023 (39)	Study 2	4	2	3	9/9
Ida, 2021 (40)	Study 3	4	2	3	9/9
Chen, 2021 (41)	Study 4	4	1	3	8/9
Kortekaas, 2020 (42)	Study 5	4	2	3	9/9
Mazzoni, 2020 (43)	Study 6	3	2	3	8/9
Hewavisenti, 2020 (44)	Study 7	4	2	3	9/9
Solomon, 2019 (45)	Study 8	4	2	3	9/9
Xiao, 2019 (46)	Study 9	4	2	3	9/9
Duhen, 2018 (47)	Study 10	4	2	3	9/9
Vora, 2017 (48)	Study 11	4	2	3	9/9